



**MCC  
Indonesia  
Nutrition  
Project  
Impact  
Evaluation  
Final Report**

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## GLOSSARY

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Akademi bidan	Midwife training college
<i>Anggaran Pendapatan dan Belanja Desa (APBDesa)</i>	Village-level revenue database
<i>Bahirak</i>	Slang Indonesian term for open defecation
<i>Bantuan langsung masyarakat (BLM)</i>	Direct community assistance grants provided by Generasi
BCG	Bacillus Calmette-Guérin
<i>Biaya operasional kesehatan (BOK)</i>	Puskesmas' health operational fund
<i>Bidan</i>	Midwife/midwives
BKIA	Maternal and child health facility
BLM	<i>Bantuan langsung masyarakat</i>
BMI	Body mass index
<i>Bubur instan</i>	Instant porridge
<i>Grafik Pertumbuhan Anak (GPA)</i>	Growth monitoring book, also called the KMS
<i>Buku kartu menuju sehat (KMS)</i>	Growth tracking chart
<i>Buku kesehatan ibu dan anak (KIA)</i>	Mother and child health handbook
CAPI	Computer assisted personal interviewing
CBA	Cost-benefit analysis
CDD	Community-driven development
CED	Chronic energy deficiency
CI	Confidence interval
CLTS	Community-led total sanitation
CPM	Certified Professional Midwife
<i>Dacin</i>	Upright hanging scale
<i>Dana desa (DD)</i>	Village-level funding
<i>Desa</i>	Village
<i>Desa Facilitator/Kader Pemberdayaan Masyarakat Desa (FD/KPMD)</i>	Generasi village facilitators and volunteers
DHO	District health office
DHS	Demographic and Health Surveys
<i>Dinas kesehatan kabupaten</i>	District health office (DHO)
<i>Dinas kesehatan provinsi</i>	Province health office (PHO)

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<i>Dinas Pemberdayaan Masyarakat dan Desa Kabupaten</i>	District Community and Village Empowerment Office
DPT	Diphtheria, tetanus, and pertussis
<i>Dusun</i>	Subvillage
ERR	Economic Rate of Return
EBF	Exclusive breastfeeding
FGD	Focus group discussion
GNI	Gross National Income
GoI	Government of Indonesia
HB	Hepatitis B
HFIAS	Household Food Insecurity Access Scale
HH	Household
HIB	Haemophilus influenzae type B
ICC	Inter-cluster correlation
IDI	In-depth interview
IFA	Iron folic acid
IFLS	Indonesian Family Life Survey
ILO	International Labour Organization
IPV	Inactivated polio vaccine
IRB	Institutional review board
ITT	Indicator tracking table
IYCF	Infant and young child feeding
<i>Java Barat (JaBar)</i>	West Java province
<i>Java Timur (JaTim)</i>	East Java province
<i>Kabupaten</i>	District
<i>Kader desa</i>	Village volunteers
<i>Kader posyandu</i>	Integrated health service post volunteer
<i>Kalimantan Barat (KalBar)</i>	West Kalimantan province
<i>Kalimantan Tengah (KalTeng)</i>	Central Kalimantan province
<i>Kartu menuju sehat (KMS)</i>	Healthy growth chart
<i>Kecamatan</i>	subdistricts
<i>Kelas balita</i>	Class for caregivers of young children
<i>Kelas ibu hamil</i>	Maternal health class
<i>Kepala desa (KD)</i>	Village head
<i>Kesling</i>	Environmental health

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<i>Kesmas</i>	Public health sector
KPI	Generasi key performance indicator
LBW	Low birthweight
<i>Lingkungan</i>	Sub-village unit for villages that are called kelurahan instead of desa, equivalent to dusun
LiST	Lives Saved Tool
LNS	Lipid-based nutrient supplements
LT	Long-term
<i>Makanan empat bintang</i>	“Four-star” diet
MCA-I	Millennium Challenge Account-Indonesia
MCC	Millennium Challenge Corporation
MDD	Minimum detectable difference
MDI	Minimum detectable impact
M&E	Monitoring and evaluation
MIYCF	Mother, infant, and young child feeding
MNP	Micronutrient powder
MoH	Ministry of Health
MT	Medium-term
MUAC	Middle-upper arm circumference
<i>Musyawarah Antar Desa (MAD)</i>	Inter-village meeting
<i>Najis</i>	Ritually unclean
NGO	Non-governmental organization
<i>Nusa Tenggara Barat (NTB)</i>	West Nusa Tenggara province
<i>Nusa Tenggara Timur (NTT)</i>	East Nusa Tenggara province
OD	Open defecation
ODF	Open-defecation free
OECD	Organisation for Economic Co-operation and Development
OJT	On-the-job training
OLS	Ordinary least squares
ORS	Oral rehydration salts
<i>Pedoman Teknis Operasi (PTO)</i>	Technical Operations Manual
<i>Pemberian Makanan Tambahan (PMT)</i>	Supplementary food

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<i>Pemberian Makanan Tambahan (PMT) pemulihan</i>	PMT recovery—fortified or unfortified food supplements for children under 5 identified as stunted or underweight
<i>Pendidikan Anak Usia Dini (PAUD)</i>	Early childhood education and development
<i>PHO</i>	Province health office
<i>Penanggung Jawab Operasional (PJO)</i>	Operational managers
<i>PKH</i>	Program Keluarga Harapan, a conditional cash transfer program for families
<i>Polindes</i>	Village health post for labor and delivery
<i>Posyandu/pos pelayanan terpadu</i>	Monthly integrated maternal and child health service post
<i>Poskesdes/ponkesdes</i>	Village health post
<i>PPP</i>	Purchasing power parity
<i>Program Nasional Pemberdayann Masyarakat—Generasi sehat dan Cerdas (PNPM-Generasi)</i>	National Community Empowerment Program: A Healthy and Smart Generation
<i>Program Air Minum dan Sanitasi Berbasis Masyarakat (PAMSIMAS)</i>	Community-based drinking water and sanitation program
<i>Promkes</i>	Health promotion/outreach worker
<i>Provinsi</i>	Province
<i>Pusat kesehatan masyarakat (Puskesmas)</i>	Subdistrict health center
<i>Pustu</i>	Puskesmas Pembantu, or satellite puskesmas
<i>PSRA</i>	Private sector response activity (renamed sanitation grant-making activity)
<i>PSU</i>	Primary sampling unit
<i>RCT</i>	Randomized controlled trial
<i>Riskesdas (Riset Kesehatan Dasar)</i>	Basic health research
<i>Rukun tetangga (RT)</i>	Subvillage or neighborhood (smallest administrative level)
<i>Rukun warga (RW)</i>	Subvillage or neighborhood (smallest administrative level)
<i>Sanitasi Total Berbasis Masyarakat (STBM)</i>	Sanitasi Total Berbasis Masyarakat or Indonesian National Strategy for Community-Based Total Sanitation and Hygiene
<i>Satker</i>	District workforce
<i>SSU</i>	Secondary sampling unit
<i>ST</i>	Short-term

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SUN	Scaling up nutrition
<i>Sulawesi Barat (SulBar)</i>	West Sulawesi
<i>Sulawesi Utara (SulUt)</i>	North Sulawesi
<i>Sumatera Selatan (SumSel)</i>	South Sumatra
<i>Taburia</i>	Micronutrients
TBA	Traditional birth attendant
<i>Timbangan jarum</i>	Analog hanging scale used with a sling
<i>Tim Desa Pemberantas BABS</i>	Village sanitation committee
<i>Tim Dusun Pemberantas BABS</i>	Subvillage sanitation committee
ToT	Training of trainers
<i>Tupoksi</i>	Main duties and functions
UNICEF	United Nations Children’s Fund
VSL	Value of a Statistical Life
WHO	World Health Organization

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## EXECUTIVE SUMMARY

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Child stunting affected an estimated 36 percent of children under age 5 in Indonesia in 2013, despite decades of reductions in poverty, child mortality, and the percentage of underweight children (UNICEF, WHO, World Bank 2013). To help reduce stunting and other dimensions of undernutrition, the Millennium Challenge Corporation (MCC) funded the \$120 million Community-Based Health and Nutrition to Reduce Stunting Project, also known as the Nutrition Project. The Nutrition Project was implemented in 11 of Indonesia’s 34 provinces from 2013–18 by the Millennium Challenge Account-Indonesia (MCA-I), in partnership with the GoI, specifically the Ministry of Health and the Ministry of Villages, and the Local Solutions for Poverty team at the World Bank.

MCC contracted with Mathematica to conduct a rigorous randomized impact evaluation of the Nutrition Project to understand the Project’s impacts on stunting and on related maternal and child health outcomes. The evaluation was conducted in 3 of the 11 provinces where the Project was implemented and sought to answer three key questions: (1) What was the impact of the Nutrition Project’s package of supply- and demand-side activities on key outcomes, including behavioral practices, receipt of health services, and child health outcomes?; (2) What was the impact of the Nutrition Project on key subgroups, such as those defined by socioeconomic status, caregivers’ education, children’s gender, and service availability?; and (3) How were the various components of the Nutrition Project implemented?

This report presents the endline findings for the impact evaluation based on a largely quantitative data collection effort conducted between January and April 2019, about one year after the end of the Project. It focuses mainly on the impact-related questions (questions 1 and 2 above); we largely answered the implementation-related question (question 3 above) in the interim report (Beatty et al. 2018).

### ES.1 Overview of the Nutrition Project

The Nutrition Project sought to improve the health and nutrition of pregnant women and children under age 5, with an emphasis on children under age 2. Project activities consisted of several demand- and supply-side interventions, which MCC divided into three major components:

1. The community project activity known as PNP-Generasi or just Generasi (the demand-side activity). This activity provided block grants and facilitation to *desa* (villages) for activities that involved improving access to health and education services. Generasi included 12 health and education indicators; progress on these indicators was one criterion determining the size of the annual block grant.
2. A set of supply-side activities that primarily engaged health providers. The supply-side activities that were implemented included the following: infant and young child feeding (IYCF) training; growth monitoring training; providing anthropometric kits; distributing an improved formulation of iron folic acid (IFA) to pregnant women; community-led total sanitation (CLTS) training and implementation; and an activity designed to encourage private sector participation in improving child health through improved

sanitation. (Two additional activities, distributing micronutrients for children and a service provider incentives activity were planned but were ultimately cancelled.) MCC supported the supply-side activities across the provinces where GoI was implementing Generasi, so that each participating kecamatan received a package of both demand- and supply-side interventions.

3. A national and sub-national communications campaign to promote awareness about stunting. The communications campaign covered both treatment and control areas and is therefore not covered by the impact evaluation.

The Project was planned such that different activities would be synchronized to have the maximum impact on a cohort of children who would benefit from various activities during gestation and the first 1,000 days of life. However, the Project could not fully realize the anticipated synchronicity across activities due to delays in the implementation of several of the supply-side activities. Specifically, providers in some areas did not receive training until near the end of the Compact, after other activities had already been completed. Further, IFA tablets were distributed only towards the end of the Project, so far fewer cohorts of women than expected received IFA while benefiting from other Project components. MCA-I did not fund the service provider incentives activity or distribute micronutrients, which were included in the original implementation plans.

## ES.2 Research design

We used a randomized controlled trial to rigorously assess the effectiveness of the Nutrition Project. The random assignment procedure involved three stages: (1) identifying 225 eligible *kecamatan* (subdistricts) in the three provinces for random assignment, (2) randomly assigning these kecamatan into groups of 130 treatment and 95 control, and (3) randomly selecting 95 of the treatment kecamatan for inclusion in the study. This procedure resulted in a sample of 95 treatment and 95 control kecamatan for the study. To assess impacts of the package of activities implemented under the Project, we compared outcomes between the treatment and control groups about one year after the end of the Project.

## ES.3 Data sources

Most of the analysis in this report is based on in-person surveys conducted with a range of respondents in treatment and control areas at endline, in early 2019. SurveyMETER, an Indonesian data collection and research firm, administered the endline surveys to 9,120 households with children 0–35 months old (household heads and child caregivers); 2,405 health service providers (kader posyandu, bidan, bidan coordinators, nutritionists, and sanitarians); 784 desa administrators; and 22 *kabupaten* (district) administration staff. The survey response rates were 90 percent for the household surveys and close to 100 percent for other respondents. For our analysis of Generasi, we complemented these surveys with administrative information from two databases that included: (1) desa-level spending on Generasi-funded activities from 2012–17 from the Ministry of Villages, Disadvantaged Regions, and Transmigration; and (2) desa-level spending on “stunting prevention” activities from Bappenas, the Ministry of Planning.

## ES.4 Key findings

The key findings on the impacts of the Nutrition Project in each of the main areas we explored in this study are as follows:



**Generasi.** Using a community-driven development (CDD) model, Generasi provided facilitation and annual block grants (also known as *bantuan langsung masyarakat*, or BLM) of approximately US\$5,000 per year, on average, to desa to be used for activities that could lead to improvements in child and maternal health and education in rural communities. Kecamatan allocated Generasi block grants to each desa based on the number of pregnant women and children in each desa, the difficulty of accessing education and maternal and child health services, and, after the first year, the progress made on 12 health and education indicators during the previous calendar year.

MCC provided financial support to Generasi in 11 provinces. In eight of these provinces, those in which Generasi was operational prior to MCC's involvement, MCC funded Generasi between 2014 and 2016. In the remaining three provinces, those in which we conducted the impact evaluation, MCC supported Generasi between 2014 and 2017.

We looked at several aspects of Generasi implementation, including which indicators communities chose to try to improve and what they spent funds on. According to desa administrators, out of the 12 Generasi indicators, desa most commonly chose to focus on the those related to common posyandu functions: monthly weighing (88 percent of desa), complete childhood immunizations (83 percent of desa), and ensuring monthly weight increases for children under 2 (83 percent of desa).

Consistent with the focus on the indicator of weight increases for young children, *permbelian makanan tambahan* or PMT, supplementary food for households with pregnant women and children under 5, was the most common activity supported by Generasi; common to nearly all desa. Other common activities were incentives for kader posyandu or contract bidan, likely for transport; health and nutritional counseling, which could include transport for pregnant women and children to get to health checkups; IYCF training for kader posyandu and bidan; equipment for the posyandu; infrastructure support for water and sanitation; and kelas ibu hamil or kelas balita (counseling sessions for pregnant women and mothers of young children).

We also considered how sustainable the effects of Generasi have been now that it has been phased out. One measure of sustainability is whether the types of activities funded by the desa have changed over time. We find that many Generasi-like activities are being sustained and that control areas are also spending funds on activities supported under Generasi. In 2018, there were modest differences in spending on different categories among Generasi and non-Generasi desa. Generasi desa were more likely than control desa to spend desa budget on community health promotion activities, growth monitoring and PMT, and training for kader desa relative to control desa. By 2019, these differences were even smaller among treatment and control groups; and spending declined slightly for both groups. Overall this indicates that Generasi areas largely sustained their spending on activities they supported during Generasi.

Looking at the findings on the Generasi indicators, the Nutrition Project had positive impacts on 5 of the 10 health-related Generasi indicators, but these impacts were modest. The Project had a statistically significant impact of 9 percentage points on receipt of 90 IFA pills during pregnancy. It also positively affected monthly weighing of children (for two separate age groups) and attendance at group counseling sessions (for two types of sessions). However, these impacts were small (less than 10 percentage points) and unlikely to be sufficient to drive large changes in health outcomes. There were no impacts on the other indicators, including prenatal checkups, delivery with a skilled professional, postnatal checkups, complete immunizations, or receipt of vitamin A. (See Figure ES.1 below for a summary table of maternal and child health results. Indicators with a 🌱 icon identify Generasi indicators.)



**Infant and young child feeding (IYCF) and growth monitoring training.** Two core components of the Nutrition Project were nutrition-focused trainings for service providers that included (1) a comprehensive training on IYCF topics and (2) a training on how to measure and monitor the growth of infants and young children (growth monitoring training). MCA-I worked with the Ministry of Health to cascade these trainings from the national level through multiple intermediate administrative levels to ultimately train primary care providers and volunteer health workers who reach the target beneficiaries.

Providers were substantially more likely to have received IYCF training in treatment areas compared to control areas. At endline, about 70 percent of bidan coordinators and nutritionists in treatment areas reported that they had been trained in IYCF since 2014. These proportions are substantially higher than in control areas, by a statistically significant 35 and 27 percentage points, respectively. At the desa level, about 60 percent of bidan and kader posyandu in treatment areas reported that they had received such training, both about a statistically significant and large 40 percentage points higher than in control areas.

The Project also had a positive but more modest impact on the share of providers trained in growth monitoring. At endline, about 35 percent of bidan coordinators and 58 percent of nutritionists in treatment areas reported that they had been trained in growth monitoring since 2014. These were both higher than the rates in control areas, (a statistically significant 17 and 15 percentage points, respectively).

Both IYCF and growth monitoring trainings were slightly longer, covered a wider range of topics, and used more interactive teaching methods in treatment areas compared to control areas. However, many desa-level participants in treatment areas did not recall receiving training on one-on-one or group counseling approaches as part of their IYCF training, although this was supposed to be an integral part of trainings to help providers engage households in behavior change. Despite the increased training participation and improved characteristics of the trainings in treatment areas, Project impacts on provider and caregiver knowledge related to basic breastfeeding topics (which was already high before the IYCF trainings), growth measurement, and stunting were modest, at best.



**Maternal and child health outcomes.** The Nutrition Project was designed to achieve its key long-term outcome—improved child health and nutritional status—through a set of interventions that targeted the 1,000 days from conception until age 2, a critical period for children’s growth and brain development (Karakochuk et al. 2017). These interventions were expected to improve a broad range of medium-term maternal and child health outcomes over this period. (Figure ES.1 summarizes the impacts on these outcomes.)

**FIGURE ES.1 SUMMARY OF PROJECT IMPACTS ON MATERNAL AND CHILD HEALTH OUTCOMES**

Outcome	Impact summary	Adjusted impact
Received 4+ prenatal checkups	→	2
Received at least 90 IFA pills	↗	9***
Deliveries assisted by a skilled provider	→	0
Received 3+ postnatal checkups (mothers/infants)	→	0/3
Full set of immunizations for children	→	2
Vitamin A intake for children	→	2
Women ever attended kelas ibu hamil/balita	↗	8***/7***
Early initiation of breastfeeding (0-23 mo olds)	→	4
Exclusive breastfeeding until age 6 mo	↗	9**
Complementary feeding (diversity/frequency)	→ ↗	2/9***
Monthly weight checks (0-5/0-23 month olds)	↗	5*/8***
Length checks in last year (0-11/12-35 month olds)	→ ↗	-3/11***
Underweight/stunted diagnosed at posyandu	→	-1/-5
Incidence of diarrhea (0-35 month olds)	→	0
Generasi indicator	→ No impact    ↗ Positive impact	

**Prenatal care and delivery.** The Project, through Generasi, sought to encourage pregnant women to receive at least four prenatal checkups, consume 90 IFA pills during pregnancy, and to deliver at a health facility or with a skilled professional. Most mothers met the Generasi target of four prenatal checkups, but this target was met equally across treatment and control groups and was almost unchanged from baseline. However, the Project affected the location of prenatal checkups—it encouraged more pregnant women to seek prenatal care at the posyandu, which could translate into greater convenience for expectant mothers. The Project had significant impacts of 10 and 9 percentage points on receipt and consumption of the recommended 90 IFA pills during pregnancy, respectively. However, only 34 percent of mothers in the treatment group received the recommended number of pills and only 23 percent consumed the recommended

number. The percent of deliveries assisted by a trained professional or conducted at a facility greatly improved from baseline, but remained similar in the treatment and control groups.

**Postnatal care and posyandu attendance.** Less than one in five mothers and one in four babies met the Generasi target of three postnatal checkups, and these targets were met equally across treatment and control groups. Generasi was also designed to encourage greater utilization of the posyandu by pregnant women and caregivers of young children, as progress on most of the Generasi indicators could be fulfilled at the posyandu. The findings suggest that the Project had a modest impact on the likelihood of posyandu attendance, but little impact on the frequency of attendance, which was typically slightly lower than the recommended monthly frequency.

**Child immunizations.** The Project aimed to improve immunization rates, which are important to reduce child morbidity and mortality. At endline, about two-thirds of children 12–35 months old in the treatment group achieved the Generasi indicator of receiving a complete set of immunizations for their age, similar to the fraction in the control group. Only about one-third of children 6–35 months old in the treatment group complied with the recommended Vitamin A intake, despite improvements since baseline in receipt of the first dose, and this was similar in the treatment and control groups. Thus, the Project had no impact on complete set of immunizations or Vitamin A receipt.

**Nutritional group counseling sessions.** The Project envisioned that bidan and kader posyandu who received the IYCF training would pass on the knowledge they gained to pregnant women and caregivers of young children in their communities in two ways: (1) one-on-one prenatal and postnatal checkups, as well as other one-on-one counseling at the posyandu; and (2) nutritional counseling sessions, called *kelas ibu hamil* for pregnant women and *kelas balita* for caregivers of young children, held in a group setting.

The Project induced more posyandu to hold group counseling sessions, and more pregnant women and caregivers to participate in them, but overall participation rates remained low. According to kader posyandu, about 66 percent of posyandu in treatment areas had ever held a *kelas ibu hamil* and 52 percent had ever held a *kelas balita*. These percentages are higher than in the control group, by a statistically significant 13 and 17 percentage points, respectively. Twenty-nine percent of mothers in treatment areas reported ever attending a *kelas ibu hamil*, a statistically significant 8 percentage points higher than in control areas. For *kelas balita*, only about 16 percent of caregivers in treatment areas ever attended a session, a statistically significant 7 percentage points higher than in control areas. The main reason cited by respondents for not participating was that they did not know about the group counseling sessions. Men rarely attended group counseling sessions, even though Generasi added an indicator for husbands' participation in the sessions because of their important role in household decision-making, especially around nutrition. Fourteen percent of men in the treatment group had ever attended either type of session and this result was not statistically different from the control group.

**Feeding practices.** Age-appropriate nutrition in early childhood, which includes age-appropriate breastfeeding and complementary feeding of solid and semi-solid foods, is critical for healthy

growth. These topics were a focus of the IYCF trainings, and were included as Generasi indicators.

Age-appropriate breastfeeding includes early initiation of breastfeeding, exclusive breastfeeding until age 6 months, and continued breastfeeding until age 2 years. At endline, about half of mothers initiated breastfeeding within one hour of birth; this measure improved substantially from baseline, but the improvements were similar in the treatment and control groups. Nearly all children were breastfed at some point, and continued breastfeeding was similar in the treatment and control group (about two-thirds of children meeting the definition of continued breastfeeding until age 2 years). The Project had positive impacts on exclusive breastfeeding; the magnitude of the impact varies depending on the definition used, but amounts to about a 20 percent increase over the rate in the control group. The impact on exclusive breastfeeding occurred by the Project modestly reducing the prevalence of formula feeding and the premature introduction of solid foods.

In terms of complementary feeding, the vast majority of children over 6 months were given complementary foods, as recommended, in both the treatment and control groups. However, at endline, only about 41 percent of children 6–23 months old in the treatment group received the recommended dietary diversity in the previous day, defined as consuming foods from at least four of the seven recommended food groups. Only about 64 percent received the minimum recommended meal frequency, which depends on age and breastfeeding status. Minimum dietary diversity was similar to the control group, but minimum meal frequency was a statistically significant 8 percentage points higher in the treatment group. Only about 28 percent of children in this age group met the criterion for minimum acceptable diet, which combines the dietary diversity and meal frequency indicators. This was a statistically significant 5 percentage points higher in the treatment group than the control group, driven by the impact on meal frequency.

***Undernutrition prevention.*** The Project sought to encourage regular growth monitoring—measuring weight and length/height and tracking changes over time—to contribute to preventing and treating undernutrition. More than three-quarters of 0–5 month olds and more than half of 0–23 month olds in the treatment group were weighed monthly (monthly weighing was the targeted frequency for Generasi indicators), and this was very similar in the control group. In terms of length measurement, about three-quarters of 0–11 month olds and two-thirds of 12–35 month olds in the treatment group had their length taken in the last year. For 0–11 month olds, this percentage is similar to the control group, although there is a large increase since baseline in both groups. For 12–35 month olds, this measure is a statistically significant 11 percentage points higher than in the control group, and there is little change since baseline in the control group. On average, 12–35 month olds in the treatment group who had their length taken in the last year were measured six times, slightly higher than in the control group and much higher than the recommended frequency according to GoI guidelines.

We also examined participation in PMT, a supplementary food program for children under 5 identified as stunted or underweight that played a very significant part in Generasi, as the majority of Generasi funds were devoted to PMT. The Project modestly increased PMT participation by posyandu in 2017 in treatment areas relative to control areas, but participation

was similar (and higher) in both groups in 2018 once Generasi wound down (suggesting that after Generasi ended posyandu were able to access PMT using non-Generasi funding). There was a substantial difference between the treatment and control groups in terms of PMT components in 2017 but not in 2018, suggesting that Generasi had a positive effect on the quality of PMT. Specifically, the Project slightly reduced the prevalence of packaged food in PMT and substantially increased the prevalence of vitamins, plant and animal-based protein, and fruits and vegetables.

**Child diarrhea and worms.** The Project aimed to reduce childhood illnesses like diarrhea and worms, which can reduce nutrient absorption and lead to mortality. At endline, about 7 percent of children under 6 months old in the treatment group had experienced diarrhea in the previous two weeks; this was 4 percentage points lower than in the control group, but not statistically significant. The overall incidence of diarrhea was higher but very similar in the treatment and control groups when older children were included. There is no evidence that the Project affected the incidence of worm infections, as reported by caregivers.

**Subgroup impacts.** We also examined Project impacts on all key outcomes by subgroups, including those defined by socioeconomic status, caregivers' education, children's gender, and service availability, as well as by province and cohort. Although there were some substantive differences in impacts across certain subgroups for certain outcomes (beyond those one would expect by chance), we did not identify any patterns that suggested that impacts were systematically different for particular subgroups.



**Sanitation training, implementation, and outcomes.** Because of this association between undernutrition and enteric infections, the Nutrition Project sought to also improve sanitation behaviors by leveraging the CLTS approach, which entails mobilizing communities to address open defecation and become open defecation free (ODF). A key element of CLTS is triggering, which are community gatherings that include interactive activities to help individuals confront the impact of open defecation and begin working on joint solutions. (Figure ES.2 summarizes the impacts on the primary sanitation-related outcomes.)

**FIGURE ES.2 SUMMARY OF PROJECT IMPACTS ON SANITATION OUTCOMES**

Outcome	Impact summary	Adjusted impact
Percentage of desa triggered	→	16***
Percentage of desa ODF	→	5
Percentage of households that/with:		
Openly defecated	→	-2
Unimproved latrine	→	1
Shared improved latrine	↗	2**
Improved latrine	→	-2

→ No impact    ↗ Positive impact

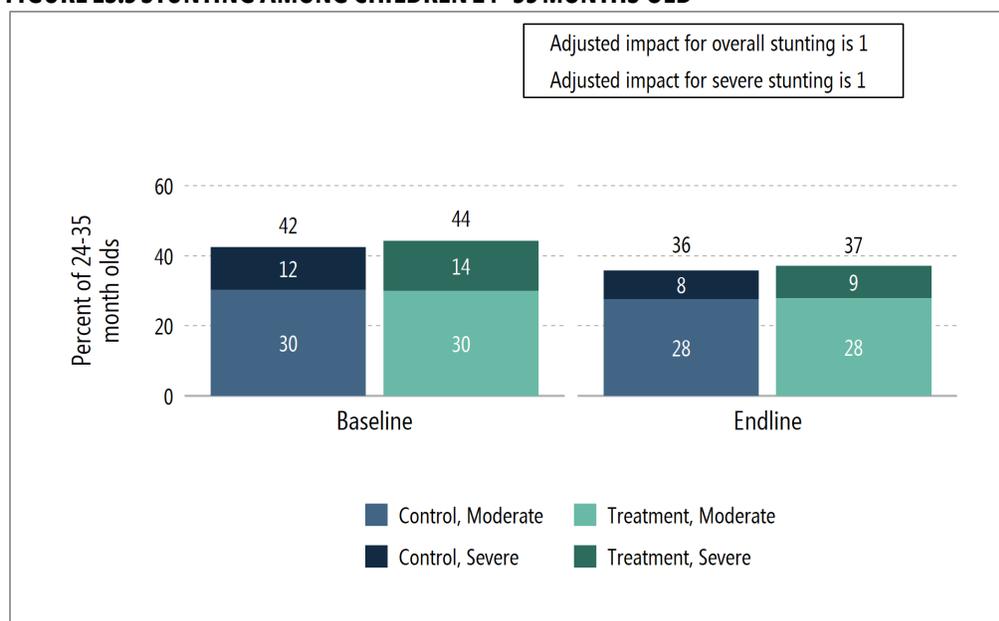
The Project increased the share of sanitarians trained in CLTS, but a high share of sanitarians in control areas also received CLTS training, through other channels. Specifically, the percent of sanitarians trained in CLTS since 2015 was a statistically significant 24 percentage points higher in the treatment group compared to the control group. However, 57 percent of sanitarians in the control group had also received CLTS training since 2015. Although it was common for other organizations to provide CLTS training, the trainings in treatment areas were longer, were more likely to include messages about stunting, and used more interactive teaching methods than other trainings.

The Project had a positive impact on the percentage of desa that have been triggered. On average, sanitarians in treatment areas reported that about 74 percent of desa that they oversee had been triggered, a statistically significant 16 percentage points higher than in control areas. However, the proportion of desa that had been verified as ODF was low in treatment areas—about 2 in 10—and similar to control areas. The limited impacts on ODF despite more positive impacts on triggering are consistent with two key findings from the interim study (Beatty et al. 2018): (1) a key post-triggering step—that the community develops an action plan around how the community will change behavior and eliminate open defecation—was rarely implemented; and (2) communities lacked funding for latrine construction and sanitation entrepreneurs were largely inactive in Project areas, despite Project support.

Consistent with the lack of impact on ODF, the Project had no impact on the types of sanitation facilities reported by households, nor on their sanitation-related behaviors. Although the vast majority of households (about 9 in 10 in treatment areas) had access to some type of latrine, a large share of these households continued to use unsafe sanitation practices, including open defecation and not disposing of children’s stools in the latrine. Further, a substantial fraction of latrines were maintained in an unsanitary condition, according to the survey team. Thus, the improved characteristics of trainings in treatment areas relative to those in control areas did not lead to larger effects on key sanitation-related outcomes that might have affected stunting.



**Anthropometric outcomes for children.** The Project’s key long-term outcome was to improve health and nutritional status among pregnant women and children, as measured by rates of child stunting, wasting, underweight, and low birthweight. Overall stunting rates declined between baseline and endline, driven mainly by a decrease in severe stunting. At endline, 37 percent of children 24–35 months old in treatment areas—the cohort with the most Project exposure—were stunted, a decrease from the baseline level of 44 percent (Figure ES.3). However, the decrease in stunting for this and other cohorts was similar in treatment and control areas; the Project therefore had no impact on stunting, even for the cohort with the most Project exposure. The Project also had no impact on the percent of underweight or wasted children, and did not substantively reduce the rate of low birthweight. These findings are consistent with the limited impacts on the maternal and child health outcomes described above, which were expected to drive changes in stunting.

**FIGURE ES.3 STUNTING AMONG CHILDREN 24–35 MONTHS OLD**

Source: Baseline and endline caregiver surveys

Sample size: 916 caregivers (baseline); 4,513 caregivers (endline)



**Cost-benefit analysis.** We conducted a cost-benefit analysis (CBA) of the Nutrition Project to assess the extent to which the Project’s benefits were commensurate with its costs. Based on the pattern of impacts, the only economic benefit stream of the Project that likely materialized in practice was reduced mortality as a result of impacts on maternal and child health outcomes. However, we estimated that these benefits were limited; the economic rate of return (ERR) of the Project was close to zero percent. In contrast, the CBA conducted at the start of the Project resulted in an estimated ERR of 16 percent. The difference between the two CBAs is in large part due to the implementation challenges experienced, which led to there being fewer potential beneficiaries and lower impacts, and applied especially to the activities that were initially expected to have the largest economic benefits.

## ES.5 Conclusion and recommendations

We propose several explanations for why the Project had no impact on long-term outcomes (stunting, wasting, underweight, and low birthweight). These relate to aspects of the Project’s theory of change that was in some ways not realized in implementation:

1. Implementation delays led to limited synchronicity between activities. The Project expected that all activities would synchronize to affect cohorts of children for the 1,000 days between conception and age 2; yet many of the training delays meant that this synchronicity didn’t occur.
2. There were weaknesses in CLTS training content, similar trainings in control areas, and limited effectiveness of triggering in achieving ODF status. Although the MCA-I-funded trainings covered more topics and used more innovative methods than other CLTS

trainings, our 2018 interim study showed that the training content could have been more detailed, especially related to triggering. The high fraction of CLTS training in the control areas limited the contrast with the treatment areas. There was also a program logic breakdown between triggering and ODF—75 percent of desa were triggered but only 21 percent were ODF; we would not expect child diarrhea to decline when OD rates are still quite high.

3. Providers and clients had limited opportunities to interact, and the Project only minimally increased interactions. Impacts on maternal and child health behaviors targeted by IYCF trainings were modest. We hypothesize that the IYCF training did not result in larger impacts because the Project did not induce improved service access, such as more prenatal or postnatal visits, or much more contact with the posyandu through posyandu visits or nutritional counseling sessions.
4. The Project was implemented against a backdrop of great national momentum towards reducing stunting and widespread improvements in key maternal and child health indicators. Improving maternal and child health outcomes, including stunting, is a major national priority. The 2018 Riskesdas results show a national reduction in stunting from 37 percent to 31 percent from 2013 to 2018 (Riskesdas 2018). This is not to say that the Project could not have had an impact in this context—there was much room for improvement; but it would have had to make improvements in a context above and beyond the improvements already underway.

Based on our findings, we recommend the following considerations for future research and implementation:

- Undertake a study to better understand the reasons behind the decline in stunting (if one is not already underway).
- Direct efforts at expanding access to postnatal care, as access in this area is still very poor.
- Further study reasons that the Project improved exclusive breastfeeding.
- Consider how long it takes time for communities to become ODF and the effectiveness of STBM, as many communities remain ODF even after triggering.
- Design programming with an appreciation that many households with access to sanitation infrastructure still openly defecate.
- Reconsider kelas ibu hamil and kelas balita implementation – participation is currently low despite significant effort to improve it.

## 1. NUTRITION PROJECT OVERVIEW

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Child stunting affected an estimated 36 percent of children under age 5 in Indonesia in 2013, despite decades of reductions in poverty, child mortality, and the percentage of underweight children (UNICEF, WHO, World Bank 2013).<sup>1</sup> Stunting increases the risk of child morbidity and mortality from infections such as pneumonia and diarrhea (Kossmann et al. 2000; Black et al. 2008; Olofin et al. 2013). It also has long-term effects on well-being—stunting in childhood is associated with lower educational attainment and earnings in adulthood (McGovern et al. 2017; Hodinott et al. 2013; Victora et al. 2008; Alderman et al. 2006; Adair et al. 2013). At the macroeconomic level, reducing child stunting in developing countries could potentially lead to substantial increases in national income through improved economic productivity (Fink et al. 2016; Galasso and Wagstaff 2018).

To address Indonesia's undernutrition challenges, the Millennium Challenge Corporation (MCC) funded the \$120 million Community-Based Health and Nutrition to Reduce Stunting Project, also known as the Nutrition Project. The Nutrition Project was part of a broader \$600 million MCC Compact with the Government of Indonesia (GoI), which also included projects related to procurement modernization and improving land and energy sustainability. The Nutrition Project was implemented in 11 of Indonesia's 34 provinces from 2013–18 by the Millennium Challenge Account-Indonesia (MCA-I) in partnership with the GoI, specifically the Ministry of Health and the Ministry of Villages, and the Local Solutions for Poverty team at the World Bank.<sup>2</sup> MCC estimated at the outset that approximately 1.7 million children would benefit from the Project (MCA-I 2017).

MCC contracted with Mathematica to conduct a rigorous randomized impact evaluation of the Nutrition Project to understand the Project's impacts on stunting and on related maternal and child health outcomes. The evaluation investigates Project impacts in 3 of the 11 provinces where the Project was implemented (West Kalimantan, Central Kalimantan, and South Sumatra) and compares outcomes in 95 treatment *kecamatan* (subdistricts) to 95 control *kecamatan* across those three provinces.

This report presents the endline findings for this impact evaluation based on a largely quantitative data collection effort conducted between January and April 2019, about one year after the end of the Project. It builds on an interim study (Beatty et al. 2018) conducted close to the end of the Project, which assessed progress on Project implementation and short- and

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<sup>1</sup> The World Health Organization (WHO) defines stunting as having a height or length for age of more than two standard deviations below the median of a healthy reference population. In addition to stunting, the other standard anthropometric indicators of undernutrition are underweight and wasting. These are defined as having a weight-for-age and weight-for-height, respectively, more than two standard deviations below the median of a healthy reference population. Because the term malnutrition includes the overweight (high weight-for-height) indicator, we use the term undernutrition in this report to refer to the outcome of insufficient food intake and repeated infectious diseases as manifested by stunting, underweight, and wasting (WHO 2010a).

<sup>2</sup> The 11 provinces were selected due to their relatively high stunting rates. They are West Java (*Jawa Barat*), East Java (*Jawa Timur*), East Nusa Tenggara (*Nusa Tenggara Timur*), West Nusa Tenggara (*Nusa Tenggara Barat*), West Sulawesi (*Sulawesi Barat*), North Sulawesi (*Sulawesi Utara*), Gorontalo, Maluku, West Kalimantan (*Kalimantan Barat*), Central Kalimantan (*Kalimantan Tengah*), and South Sumatra (*Sumatera Selatan*).

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medium-term outcomes hypothesized to lead to the long-term outcomes such as reductions in stunting.

We organize this report into twelve chapters. In the remainder of Chapter 1, we provide background on the Nutrition Project. Chapter 2 reviews literature relevant to the Project interventions. In Chapter 3, we describe the impact evaluation design. Chapter 4 outlines the data sources and analysis methods we used for the endline study. Chapter 5 provides an overview of the characteristics of the households and health service providers, as well as the availability of health services, in the communities where the evaluation was conducted. Subsequent chapters present findings related to various components of the Nutrition Project. Chapter 6 presents findings related to *Generasi*, the community-based component of the Project. Chapter 7 presents findings related to trainings on infant and young child feeding (IYCF) and growth monitoring. Chapter 8 includes a range of findings related to maternal and child health outcomes. Chapter 9 presents findings from community-led total sanitation (CLTS) training, CLTS implementation, and related water and sanitation outcomes. Chapter 10 presents the child anthropometric outcomes that were the overall focus of the Project, including stunting. In Chapter 11, we present findings from a cost-benefit analysis of the Project. We conclude in Chapter 12.

## 1.1 Nutrition Project activities

The Nutrition Project focused on the health and nutrition of pregnant women as well as children under age 5, with an emphasis on children under age 2. These children (including those in-utero at the time of the Project) were expected to be the ultimate Project beneficiaries. Project activities consisted of multiple demand- and supply-side interventions, which MCC divided into three major components: (1) the community projects activity, which sought to create demand for health services among pregnant women and caregivers of children under age 2; (2) the supply side activity, which comprised set of interventions that target primarily health providers; and (3) the communications, project management, and evaluation activity, which included a national communications campaign to promote awareness about stunting (in the description below we focus on this component of the activity, which was most directly related to health and nutrition outcomes; the other components supported project management and monitoring and evaluation). The revised Compact allocation for the Project was \$134.2 million: \$81.6 million for the community projects activity; \$33.9 million for the supply-side activity; and \$18.6 million for the communications, project management, and evaluation activity (MCC 2019).<sup>3</sup> (As we discuss in Section 1.4, the Project ultimately spent about \$120 million.)

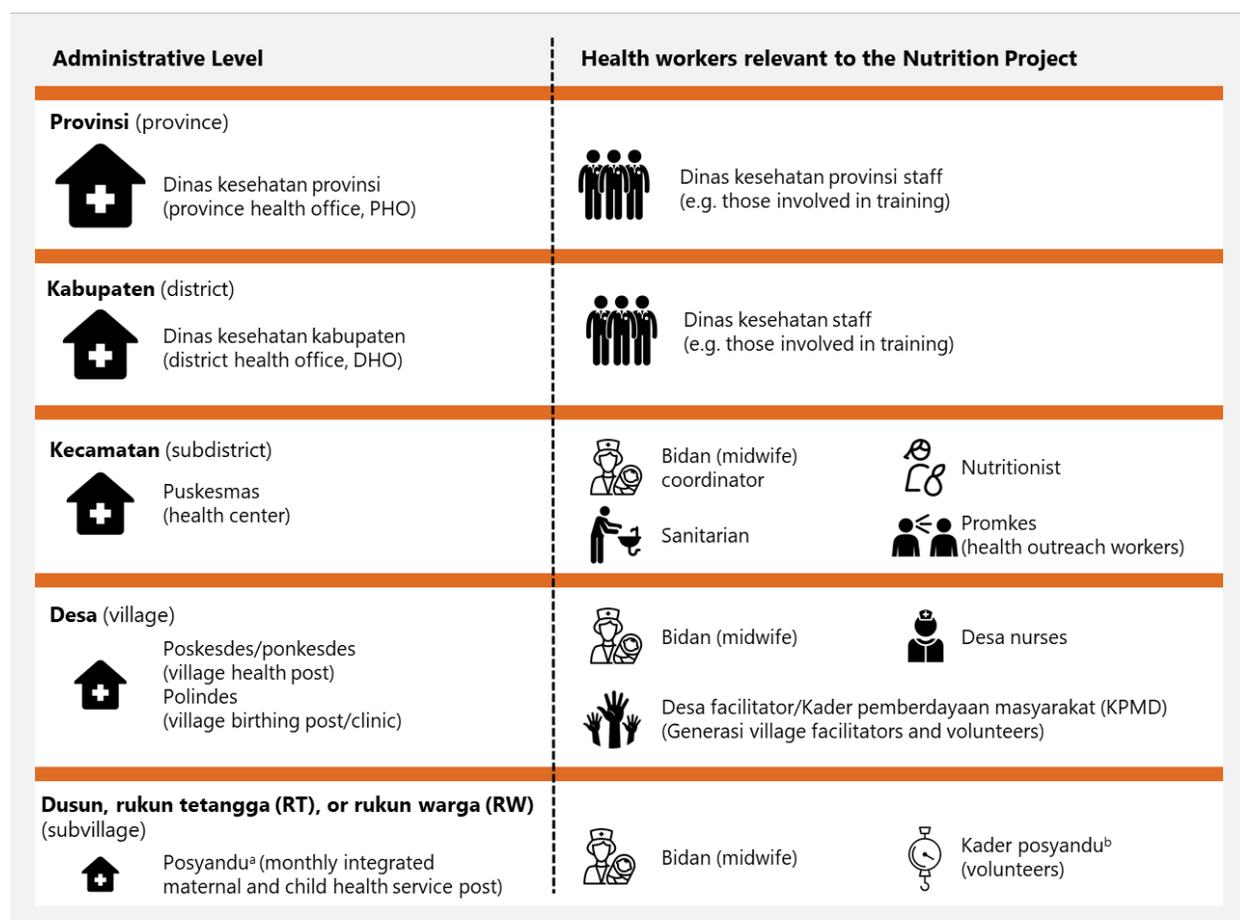
MCA-I and its partners implemented these activities in the context of a decentralized health system. Figure 1.1 outlines the structures of the Indonesian administrative and health systems that are relevant to the Nutrition Project and that we refer to throughout this report. As we describe below, most Project activities involved health facilities and workers at the *kecamatan* and/or *desa* (village) levels.

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<sup>3</sup> This was a revision from the original Compact allocation of \$131.5 million: \$81.6 million for the community projects activity; \$36 million for the supply-side activity; and \$13.9 million for the communications, project management, and evaluation activity (MCC 2011).

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FIGURE 1.1 STRUCTURE OF THE RURAL INDONESIAN HEALTH SYSTEM



<sup>a</sup>Posayndu are monthly health meetings that provide weighing and immunizations for children 0–5 and are sometimes referred to as “integrated health service posts.” They provide information and services on family planning, maternal and child health, immunization, nutrition, diarrhea, basic sanitation and essential drugs. For many people in rural desa, posyandu are the main point of contact with the formal health system, especially during pregnancy and infancy (Mahendradhata et al. 2017).

<sup>b</sup>Kader posyandu are volunteers, run the posyandu; they provide health counseling for pregnant women and mothers, and weighing services for children. Bidan from the desa, and occasionally staff from the puskesmas, attend the posyandu and provide immunizations and sometimes other health counseling.

The **community projects activity**, implemented by the Ministry of Villages, provided block grants and facilitation to desa for activities that involved improving access to health and education services. The activity was also known as *Program Nasional Pemberdayaan Masyarakat—Generasi Sehat dan Cerdas*, the National Community Empowerment Program: A Healthy and Smart Generation (PNPM-*Generasi* or *Generasi*). Kecamatan allocated *Generasi* block grants to desa based on the size of the targeted population in each desa (focusing on pregnant women and children), the difficulty of accessing maternal and child health and education services in the desa and, after the first year, the progress each desa made on 12 health and education indicators. The main participants in or recipients of this activity were community members who helped prioritize activities supported by the block grants, and pregnant women, caregivers of young children, and young children in desa who received the services funded by the grants.

The **supply-side activity**, largely implemented by the Ministry of Health, primarily engaged health providers—including *puskesmas* (kecamatan-level health centers) staff, *bidan* (midwives), and *posyandu* (desa-level child health service posts) staff—as participants. At the project design stage, it comprised the following activities: (1) IYCF training; (2) growth monitoring training (focused on assessing child growth and treating stunting, wasting, and underweight); (3) providing anthropometric kits to the *puskesmas* (length- and height-taking equipment, scales, and measuring tapes to measure middle-upper arm circumference [MUAC] for pregnant women); (4) distributing an improved formulation of iron folic acid (IFA) to pregnant women; (5) distributing micronutrients for children (marketed under the Indonesian brand name Taburia); (6) CLTS training and implementation; (7) an activity designed to encourage private sector participation in improving child health (initially known as the Private Sector Response Activity, or PSRA, and subsequently renamed to the sanitation grant-making activity); and (8) a service provider incentives activity. However, micronutrient distribution for children and the service provider incentives activity were not implemented. MCC supported the other activities across the provinces where GoI was implementing Generasi (the demand-side intervention), so that each participating kecamatan received a package of both demand- and supply-side interventions.

The **national communications campaign**, implemented by a communications firm hired by MCA-I, aimed to promote increased awareness about stunting by disseminating to policymakers and caregivers of young children messages about infant and young child feeding, hygiene, and health care practices. The messaging also emphasized the role of all household members, including mothers and fathers, in improving child health and nutrition. At the national level, the campaign used mass media, including videos, a jingle, posters, and banners, to reinforce and popularize key nutrition messages. In addition, within 11 of the 22 evaluation *kabupaten* (districts) included in the evaluation, the campaign trained *kader posyandu* (volunteers who run the *posyandu*) in all treatment kecamatan to conduct interpersonal communication at a local level. This approach reinforced the messaging around stunting at various social levels. The main participants in or recipients of the communications campaign were thus the policymakers and caregivers who were exposed to messages, and the *kader posyandu* who implemented the additional activities in the 11 kabupaten.

## 1.2 Logic model and link to ERR

The logic model in Figure 1.2 shows the pathways between the Project activities and ultimate long-term outcomes such as stunting, wasting, and underweight. The colored boxes represent outcomes that the impact evaluation planned to measure, while the white boxes represent outcomes not measured by the impact evaluation. Taken together, Generasi, IYCF training, growth monitoring training, CLTS training, and the national communications campaign were expected to lead to improved health and nutritional status among pregnant women and children.

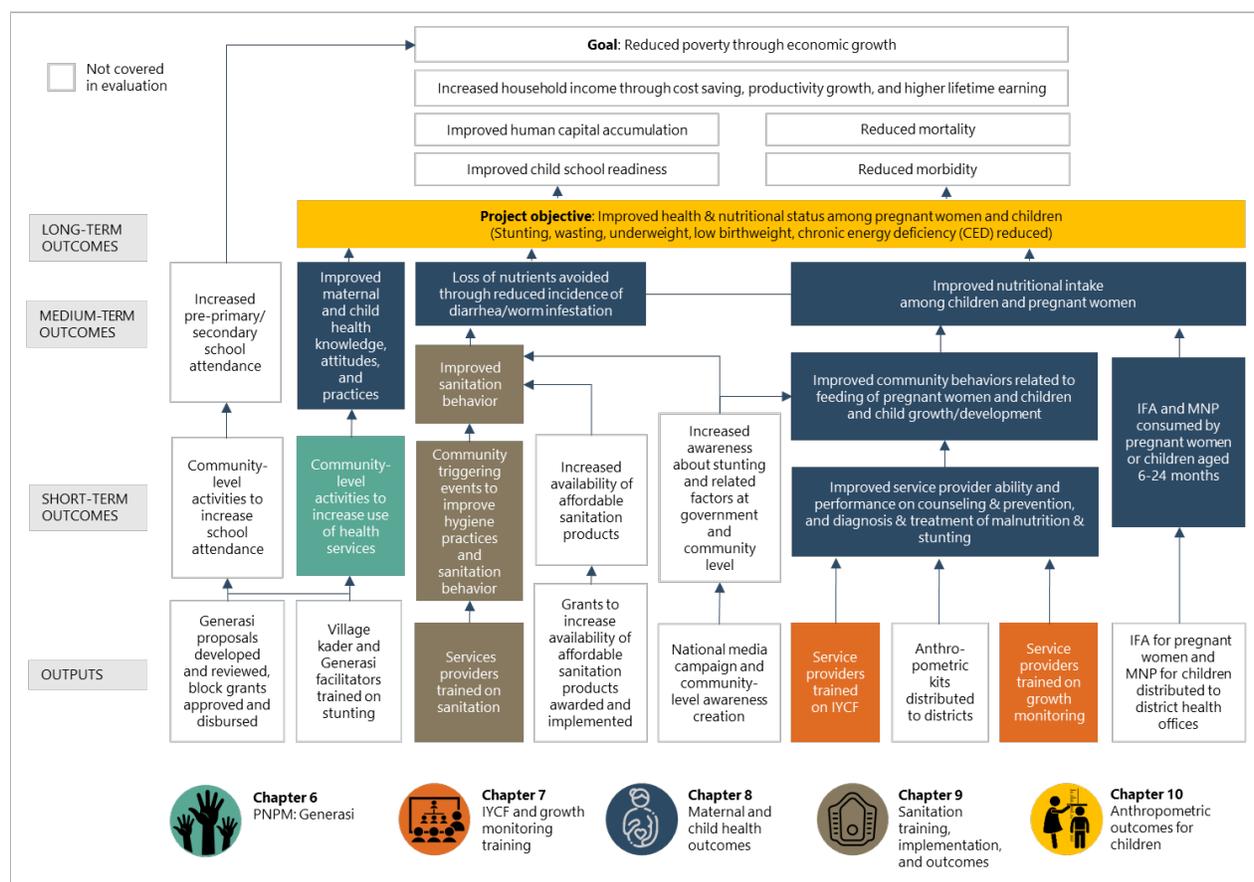
Generasi was intended to increase the community's access to and use of health services. Generasi facilitators would possess greater awareness of IYCF and nutrition projects because modules on these topics were included in the standard Generasi training, and thus they could better support communities in realizing health improvements. Communities would be incentivized to focus on health improvements because the majority of Generasi indicators were health-related. Generasi also provided funding to access services, such as transport funds for pregnant women to attend prenatal appointments or deliver with trained health provider

assistance. It also provided food assistance, such as in-kind support to poor families, families with children under age 5, or families with stunted children. Taken together, improved access to services and in-kind assistance would lead to improved maternal and child health outcomes.

MCC and MCA-I anticipated that service providers would receive training on IYCF and apply what they learned in the training through nutritional group counseling sessions for pregnant women (*kelas ibu hamil*) and for caregivers of children under 5 (*kelas balita*) held at the posyandu, as well as in one-on-one counseling and services. This, along with growth monitoring training, would improve community behavior related to nutrition among pregnant women and children, and child growth and development. These positive changes in community behavior would increase the share of women who practice exclusive breastfeeding, the introduction of complementary foods to children at the appropriate ages, and children receiving adequate health services such as immunizations, vitamin A, and micronutrients—all factors that would ultimately result in the improved health and nutritional status among pregnant women and children.

As for sanitation, the theory of change expects that sanitarians and *kader desa* (village volunteers) would receive CLTS training, and would then apply what they learned by triggering *desa* to improve sanitation behavior and hygiene practices. These sanitation and hygiene improvements—for example, constructing a latrine and no longer practicing open defecation (OD)—would lead to a reduced incidence of diarrhea and worm infestation, and the associated loss of nutrients.

**FIGURE 1.2 NUTRITION PROJECT LOGIC MODEL**



The logic model informed the development of a cost-benefit analysis (CBA) that MCC commissioned at the beginning of the Project (Cameron et al. 2013). The CBA estimated the benefits from each activity for cohorts of children exposed to the activities over the full period of implementation assuming no delays, with most of the activities expected to affect children in a window spanning the in-utero period up to age 23 months. The main benefits comprised the following: (1) reduced neonatal and child mortality, (2) reduced morbidity, and (3) increased income in adulthood. The CBA estimated the economic magnitude of these benefits based on their link with the medium- and long-term health outcomes in the logic model, using the literature available at the time. The combined benefits were then compared with the expected Project costs to estimate the Economic Rate of Return (ERR), which the CBA estimated to be 16.5 percent.<sup>4</sup> In Chapter 11, we use the impact estimates from the endline study to conduct a new independent CBA to determine whether MCC's investment was worthwhile.

### 1.3 Summary of implementation

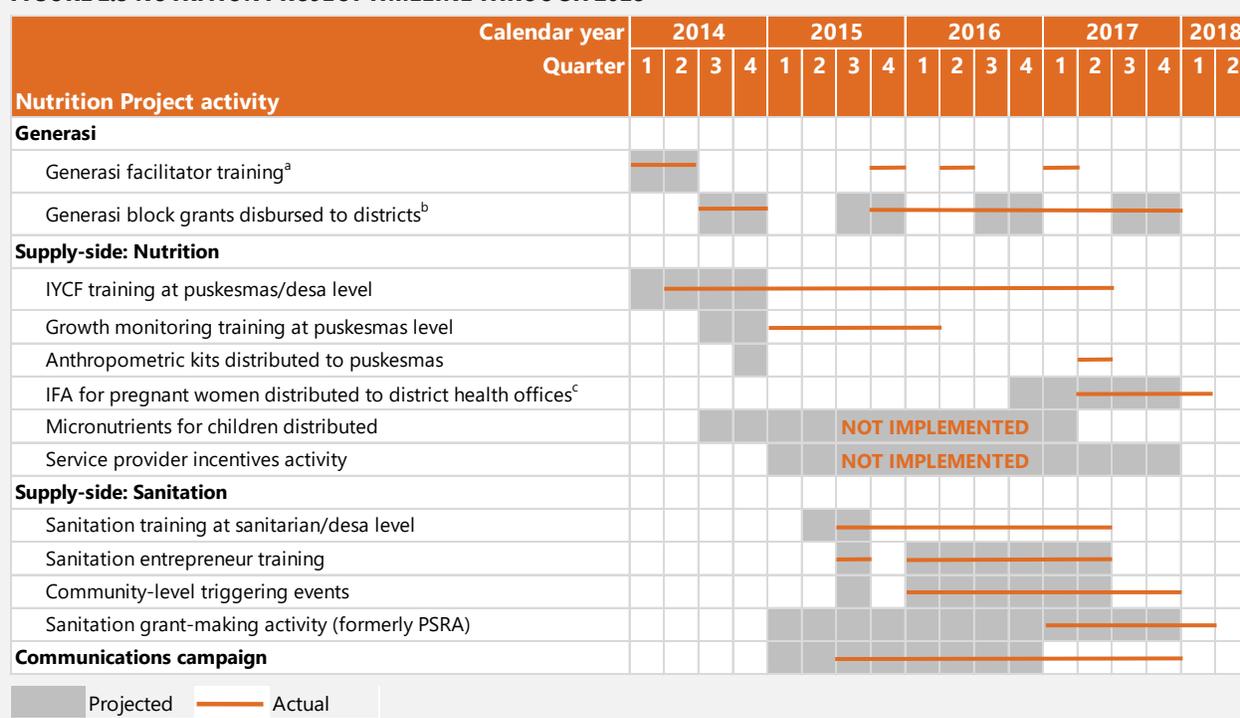
In this section we summarize when Nutrition Project activities were implemented, whether they met targets, and what the activities cost. Here we draw on the interim report (Beatty et al. 2018) (which also included an assessment of implementation quality), a document shared by MCC that explains the closeout indicator tracking table (ITT), and discussions with MCC staff.

MCA-I implemented the Nutrition Project over the course of five years, from 2013 to 2018. Figure 1.3 shows when each activity was intended to be implemented as of the time of the original evaluation design report (Beatty et al. 2014) and when implementation actually occurred over the life of the Compact. (The timeline in the figure begins in 2014 because that is when activity implementation started; preparatory activities took place in 2013.) Overall, the implementation of several Project activities occurred over a much longer period than originally anticipated because implementation was delayed in many areas; further, as mentioned above, two supply-side activities were not implemented at all. Below, we discuss the implementation of each activity in more detail.

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<sup>4</sup> The ERR is expressed in percentage terms, and is defined as the interest rate at which discounted net benefits are equal to the discounted net costs. The higher the ERR, the larger the increase in benefits per dollar spent.

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**FIGURE 1.3 NUTRITION PROJECT TIMELINE THROUGH 2018**

<sup>a</sup>The annual Generasi facilitator re-trainings in 2015, 2016, and 2017 were not envisioned in the original implementation plan but were added at a later date.

<sup>b</sup>The distribution of 2017 Generasi block grant funds to the desa continued into early 2018 but the number of desa receiving block grants had fallen sharply by this time.

<sup>c</sup>MCC estimates that the distribution of IFA to pregnant women at the desa level occurred from September 2017 to September 2018.

### Generasi implementation

Generasi was largely implemented according to schedule; over 17,000 proposals were approved for Generasi activities; and between 5,264 and 5,682 desa received grants that were disbursed between 2014 and 2016. MCC expected Generasi to continue indefinitely in treatment kecamatan and be phased into control kecamatan in 2018, but Generasi was instead phased out of the evaluation provinces in 2018 and replaced by a new community-driven development (CDD) effort at the desa level under the Village Law. (This effort consolidated CDD budgets and implementation under one mechanism.) By 2017, only 1,812 desa received grants.

A total of 685 Generasi facilitators across 499 kecamatan in 11 provinces received training on IYCF as part of their overall training and received refresher training yearly. Also due to the phase-out, the last training was in fiscal year 2016/2017.

### Supply-side implementation

Although MCA-I met or almost met targets for the supply-side activities, the majority of nutrition-related activities—puskesmas and desa-level IYCF training, growth monitoring training, anthropometric kit distribution, and IFA tablet distribution—were implemented later than planned (Figure 1.3 and Table 1.1). These delays hindered MCA-I's ability to synchronize activities, which was a key feature of the project design. For example, training started in the second year of the Compact and continued through the last year, which meant that providers in

some areas did not receive training until the end of the Compact, after other activities had already been completed. Further, although it was envisioned that trained providers would distribute IFA to pregnant women attending the nutritional counseling sessions and in their one-on-one counseling sessions, IFA tablets were distributed only towards the end of the Project, so far fewer cohorts of women than expected received IFA while benefiting from other Project components. MCA-I did not fund the service provider incentives activity or distribute micronutrients, which were included in the original implementation plans.

MCA-I experienced greater challenges with sanitation-related activities—sanitation training at the kecamatan and desa levels, triggering, and the sanitation grant-making activity (formerly PSRA). Specifically, MCA-I did not meet triggering or open-defecation free (ODF) targets, and saw some challenges implementing the sanitation grant-making activity.

**TABLE 1.1 TARGETS AND ACHIEVEMENTS FOR SUPPLY-SIDE ACTIVITIES**

Activity/Outcome	Target	Achievement	Target met?	Additional information and/or reason for not meeting target
<b>Nutrition</b>				
IYCF modules developed	Sep 2013	Sep 2013	Yes	n.a.
IYCF training conducted	18,578 officials and providers	17,531 officials and providers	Yes, for some levels	Targets met for provincial, puskesmas, and posyandu levels, but not for kabupaten representatives and bidan. The bidan training was delayed because some of the training payment documents were processed later than expected.
Growth monitoring modules developed	Sep 2013	Sep 2013	Yes	n.a.
Growth monitoring training conducted	1,558 officials and providers	1,564 officials and providers	Yes, for some levels	Trainings fell below targets at the puskesmas level because document processing delays meant that the training was conducted in a compressed timeframe. Moreover, the number of available puskesmas decreased due to kecamatan administrative boundary changes so there were fewer eligible puskesmas than anticipated. (Some puskesmas were rezoned out of treatment areas.) No explanation was provided as to why other targets were not met.
Supportive supervision training conducted	1,550 officials and providers	1,207 officials and providers	Yes, for some levels	Trainings fell below targets at the puskesmas level for the reasons discussed above.
Supportive supervision visits conducted	28,160 visits	0 visits	No	MCA-I ended up not funding these visits because they were already required as per Gol regulations.
Guidelines on integrating health, nutrition, and sanitation into desa planning and budgeting processes developed	Dec 2017	Mar 2018	Yes	These guidelines were developed; they were delayed but still developed with full participation of the Ministry of Villages.
Training on integrating health nutrition and sanitation in desa	642 providers	487 providers	No	There was insufficient time to complete the activity at the end of the Compact.

Activity/Outcome	Target	Achievement	Target met?	Additional information and/or reason for not meeting target
planning and budgeting conducted				
Anthropometric kits distributed	1,408 kits	1,186 kits	No	MCA-I distributed fewer kits than expected due to the kecamatan administrative boundary changes.
IFA tablets distributed	35,491,680 tablets	35,626,390 tablets	Yes	The distribution target was achieved but tablets were delivered in the last 6 months of the Compact and distributed to pregnant women thereafter, hindering the coordination of this intervention with the others.
Training on IFA distribution quality control conducted	2,289 providers	2,255 providers	Nearly	n.a.
Micronutrients (Taburia) distributed	18,943,200 packets	0 packets	No	Activity was cancelled after the first batch of Taburia was produced because the ingredients did not meet Gol standards
Training on Taburia distribution quality control conducted	5,094 providers	426 providers	No	MCA-I halted training due to the formulation problems.
<b>Sanitation</b>				
CLTS modules developed	Sep 2013	Sep 2013	Yes	n.a.
CLTS training conducted	7,561 officials and providers	6,724 officials and providers	Yes, for some levels	MCA-I exceeded provincial and kabupaten targets, but fell short on puskesmas and desa-level targets due to changes in the number of puskesmas, as mentioned above, and payment delays at the desa level.
CLTS training for community entrepreneurs conducted	499	460	Nearly	Not all kabupaten sent representatives to the training.
CLTS monitoring and evaluation (M&E) training conducted	779 officials and providers	739 officials and providers	Nearly	MCA-I fell slightly short of puskesmas targets due to decrease in number of puskesmas, as described above.
Triggering events at the dusun rukun tetangga (RT), or rukun warga (RW) levels conducted	6,400	4,225	No	Triggering could only occur in areas where service providers were trained, and there was a delay in training and/or submitting documents to confirm the training had occurred. (The triggering target itself already reflected lower dusun/RT/RW coverage than had originally been anticipated at Compact signing, and raised some concerns about the likelihood of the Project's ability to achieve desa-level ODF by having the effects spread throughout the desa.)
Open-defecation free (ODF) status achieved at the desa level	800	218	No	MCA-I did not meet targets due to delay in completing the training and triggering; and the fact that it can take up to two years from the time that a desa is triggered until it becomes ODF.

Activity/Outcome	Target	Achievement	Target met?	Additional information and/or reason for not meeting target
Sanitation grant-making activity proposals received	NT	13	n.a.	n.a.
Amount of sanitation grant-making activity grants awarded	\$3 million	\$807,887	No	MCA-I received fewer proposals than expected and amended three grant agreements to descope activities because grantees were not able to perform all tasks before the end of the Compact.
Number of sanitation grant-making activity grants awarded	NT	3	n.a.	MCA-I received 13 proposals and only three met the criteria for funding.
Sanitary toilets constructed or renovated as part of the sanitation grant-making activity	1,080	1,182	Yes	n.a.
External resources spent by sanitation grant-making activity grantees	\$774,387	\$706,593	No	This target was achieved with one grantee who spent resources to rehabilitate poorly constructed toilets, but another grantee did not finish toilet construction before the end of the Compact.

Source: "Indonesia closeout ITT narratives 7.31.18" document shared by MCC.

NT = no target

n.a. = not applicable

### *Communications campaign implementation*

The national communications campaign experienced delays of two calendar quarters and thereafter was largely implemented as planned. Over 225,000 campaign materials regarding stunting prevention (online videos, pamphlets, T-shirts, posters, banners, and pins) were distributed and over 4,000 television spots aired, both of which exceeded targets. However, the sub-national campaign in the three evaluation kabupaten was delayed by three calendar quarters and only occurred in 11 kabupaten compared to the 22 that were planned. In addition, activities consisted of desa-level advocacy and training of kader desa in communications, rather than the direct communication work at the desa level that was originally planned. Nevertheless, MCA-I and implementers trained over 1,500 kader desa on interpersonal skills and communication which was more than they had planned to train. They also engaged nearly 8,500 stakeholders around stunting prevention. Box 1.1 below provides examples of communications campaign materials.

BOX 1.1 COMMUNICATIONS CAMPAIGN EXAMPLES

**STANTING MENGANCAM ANAK BANGSA**

Pahami masalahnya temukan solusinya

**HAMPIR 9 JUTA**

Atau lebih dari 1/3 balita di Indonesia mengalami stunting

**STANTING ADALAH**  
Ketika balita lebih pendek dari standar tinggi badan seumurnya

**MAKANAN BAYI DAN ANAK**

SEMBANGKAN GIZINYA, SESUAIKAN PORSINYA, PERHATIKAN FREKUENSINYA, DAN PASTIKAN CARA PENGOLOHANNYA.

**MAU LEBIH TAHU? BATANG KE POSTANDU!**

6-9 BULAN	9-12 BULAN	LEBIS DARI 12 BULAN
<p>Porci: 2-3 sendok makan Frekuensi: 2-3 kali makan Selangan: buah 2 kali sehari</p> <p>Takut makanan kasar dan tidak encer Dilalah dengan diaring</p>	<p>Porci: 1/2 - 3/4 mangkuk (150 ml) Frekuensi: 2-4 kali makan Selangan: buah 2 kali sehari</p> <p>Bukan makanan orang dewasa dengan tekstur agak kasar Dilalah dengan ditumbuk</p>	<p>Porci: 3/4 - 1 mangkuk (250 ml) Frekuensi: 2-4 kali makan Selangan: buah 2 kali sehari</p>

**NAMUN MASIH ADA HARAPAN DAN JALAN KELUAR**

Stunting bisa dicegah dengan memastikan kesehatan dan kecukupan gizi pada 1000 hari pertama kehidupan

**1 HARI PERTAMA KEHIDUPAN**

**MASA KENAMILAN**

Makan makanan yang bergizi seimbang, terutama makanan bersumber protein hewani, agar janin selalu sehat dan bayi lahir selamat.

**0 - 6 BULAN**

Bayi mendapat ASI eksklusif selama 6 bulan pertama.

**6 BULAN - 2 TAHUN**

Bayi mendapatkan makanan pendamping ASI dengan jumlah, frekuensi dan keberagaman yang cukup sesuai usianya. Pemberian ASI dilanjutkan hingga 2 tahun.

Anak-anak juga harus tinggal di lingkungan yang bersih, **DI MANA SETIAP ORANG MENGGUNAKAN JAMBAAN SEHAT.**

**AGAR KESEHATAN DAN KECUKUPAN GIZI INI TERWUJUD, KELUARGA DAN MASYARAKAT PERLU DUKUNGAN PEMERINTAH UNTUK:**

- REVITALISASI POSTANDU**  
Sebagai tempat pelayanan gizi dan kesehatan yang paling dekat dengan masyarakat, posyandu perlu dioptimalkan kembali untuk dapat memberikan layanan dasar pada ibu dan balita, seperti pemantauan tumbuh kembang anak, pendidikan gizi masyarakat, juga imunisasi. Posyandu perlu diperkuat agar dapat mendeteksi anak yang tumbuh kembangnya terhambat, memberikan makanan tambahan dan merujuknya ke fasilitas kesehatan yang lebih memadai.
- PELATIHAN TENAGA KESEHATAN**  
Kecukupan tenaga kesehatan terutama bidan dan kader perlu diperkuat agar mereka mampu memberikan pelayanan gizi dan kesehatan yang lebih baik. Pelatihan ini termasuk diantaranya pelatihan konseling Pemberian Makan Bayi dan Anak (PMBA), pelatihan Sanitasi Total Berbasis Masyarakat (STBM) dan pelatihan cara mengukur tinggi dan berat badan anak.
- PEMBERIAN SUPLEMEN GIZI MIKRO UNTUK IBU & BALITA**  
Ibu hamil (Bumil) dan balita perlu kecukupan gizi mikro agar tumbuh kembang janin dan balita optimal. Karena itu, pemerintah perlu memastikan ketersediaan Tablet Tambah Darah (TTD) di fasilitas-fasilitas kesehatan tempat bund memarkukon kondisinya serta ketersediaan vitamin A dan obat cacing di setiap Posyandu.
- MEMFASILITASI KELUARGA AGAR MEMILIKI DAN MENGGUNAKAN JAMBAAN SEHAT**  
Angka stunting lebih tinggi pada anak-anak yang sering terkena diare. Angka diare anak-anak yang keluarganya buang air besar sembarangan, 66% lebih tinggi dibandingkan dengan yang keluarganya menggunakan jamban sehat. Karena itu program Sanitasi Total Berbasis Masyarakat (STBM) harus diperkuat, untuk memastikan setiap keluarga memiliki dan menggunakan jamban sehat.
- MEMFASILITASI AIR MINUM YANG AMAN**  
Salah satu penyebab yang menyebabkan stunting adalah diare. Penularannya sebagian besar melalui air. Karena itu, akses terhadap air bersih bagi masyarakat harus diperluas, dan masyarakat perlu dididik agar dapat mengolah dan menyimpan air minum dengan aman.

Source: MCA-I

### *Implications of implementation delays*

The Project was planned such that different activities would be synchronized to have the maximum impact on cohorts of children who would benefit from various activities during gestation and the first 1,000 days of life. However, the Project could not fully realize the synchronicity across activities anticipated at the design stage due to several activity delays and, in some cases, cancellation of planned activities, as described above.

More specifically, the original CBA assumed that two cohorts of children would have full exposure over the full window of activities and four cohorts would have partial exposure either in the early or late part of the window. However, due to the lack of activity synchronization, these assumptions might not hold in practice. For example, the Project was designed so that the benefits of IYCF training would synchronize with *Generasi*. That is, *Generasi* would enable communities to use block grants to improve the frequency of one-on-one services and the frequency of nutritional counseling sessions. At the same time, the training would allow providers to deliver higher quality one-on-one services and nutritional counseling sessions. Because of delays in IYCF implementation, these complementary programs might not have had the intended effect. Another example is that IFA for pregnant women was distributed to kabupaten health offices through January 2018 and distribution to pregnant women at the desa level occurred mainly from September 2017 to September 2018 (Figure 1.3). This delay meant that fewer pregnant women could benefit from Project-supported IFA than anticipated.

### *Project costs*

Here we compare MCC's actual expenditure on the Nutrition Project to planned expenditure. Overall, MCC disbursed \$120,142,353 for the Project compared to the planned amount of \$134,200,000, or about 90 percent of the planned amount (Table 1.2).<sup>5</sup> For *Generasi*, MCC met its spending target. However, the amount of spending in Table 1.2 exceeds MCC's target because the World Bank, a partner in *Generasi*, could only report the total amount of *Generasi* spending, rather than MCC's specific portion.<sup>6</sup> Supply-side activity spending was lower than anticipated (about 61 percent of the target), largely because some of the activities, like micronutrient distribution, did not occur. The communications campaign spending was lower than expected (about 75 percent of the target) because the sub-national campaign was scaled back significantly.

**TABLE 1.2 NUTRITION PROJECT SPENDING TARGETS AND ACTUALS, BY ACTIVITY, IN USD**

Activity	Target	Actual
<b>Total Nutrition Project</b>	<b>134,200,000</b>	<b>120,142,353</b>
<b>Community projects activity (Generasi)</b>	81,600,000	86,256,505
<b>Communications campaign</b>	18,600,000	10,487,073

<sup>5</sup> Expenditure targets were not available for detailed activities within each of the three main activities. However, for completeness we break down actual expenditure by these detailed activities in Table 1.2.

<sup>6</sup> In the end, MCC's funding comprised a larger share of overall *Generasi* spending than originally anticipated.

Activity	Target	Actual
<b>Administration total</b>		1,329,322
Planning and advocacy meeting at province, kabupaten, and kecamatan		613,328
Activities related to the MoV IEA		715,994
<b>Supply side total</b>	33,900,000	22,069,452
<b>Supply-side: nutrition</b>		14,067,762
Infant and young child feeding training		7,815,701
Growth monitoring training (including improving video training material)		1,541,463
Iron folic acid for pregnant women quality control training		1,107,063
Micronutrients for children quality control training		619,057
Supportive supervision		844,501
Printing of IYCF materials and child health books		608,231
Anthropometric kits (delivered to kabupaten office)		225,322
IFA tablets (delivered to kabupaten warehouse)		1,286,080
Taburia sachet inspection		20,344
<b>Supply-side: sanitation</b>		8,001,690
CLTS triggering training and triggering events		5,126,166
CLTS triggering events		842,295
CLTS M&E training		300,820
Sanitation entrepreneur training		421,147
Sanitation entrepreneur mentor training		47,455
Sanitation grant-making activity		859,340
Latrine septic tank molds (delivered to kabupaten office)		404,467

Source: Targets are from the final project report <https://www.mcc.gov/resources/story/section-ind-star-report-health-project>. Actuals are from "Indonesia CBHN cost allocation Aug 2018 FINAL.xls" document shared by MCC.

## 2. LITERATURE REVIEW

In this chapter, we review the available evidence on each of the Nutrition Project activities: Generasi, IYCF training (especially components of the training including breastfeeding and complementary feeding), growth monitoring, IFA distribution, CLTS training, and the communications campaign.<sup>7</sup> For each activity, we discuss evidence from the literature about how the activity could affect the outputs and outcomes in MCC and MCA-I's logic model discussed in Chapter 1.

### 2.1 Existing evidence



**Generasi and other CDD projects with a nutrition focus.** The literature on the effects of CDD projects is vast (see Wong (2012) and Mansuri and Rao (2013) for reviews), and Indonesia's long history with these projects provides a rich picture of CDD successes and challenges across the country (Olken et al. 2012, 2018; Voss 2008; Barron et al. 2009; Pradhan et al. 2010; McLaughlin et al. 2007). Below we first look at the evidence on the effects of Generasi, as it was a component of the Nutrition Project and was rigorously evaluated, and then turn to the evidence on other CDD projects.

A primary reason Generasi was incorporated into the Nutrition Project was that a randomized controlled trial conducted in five provinces before the Compact was developed showed promise (Olken et al. 2012).<sup>8</sup> Specifically, this impact evaluation found a significant reduction in the percentage of children under age 3 who were underweight (by a statistically significant 2 percentage points) after 30 months of Generasi implementation, although the program had no impact on stunting. In Nusa Tenggara Timur, the province with the highest baseline rates of poor nutrition outcomes prior to the intervention, Generasi had larger impacts on undernutrition: it reduced underweight rates by 9 percentage points and stunting rates by 7 percentage points (both impacts were marginally statistically significant). Across all the provinces combined, Generasi also had an impact on the receipt of maternal and child health services at the posyandu, including the frequency of weight checks for children at the posyandu and the number of iron pills distributed to pregnant women. Generasi also had a positive impact on some indicators not targeted through the program, such as facility-based deliveries, the quality of healthcare services at the posyandu, and parental knowledge of health and education topics.

After nine years of Generasi implementation (during which time the control group had not received Generasi), the evaluation team conducted a longer-term impact evaluation (Olken et al. 2018). At that time, Generasi had increased the number of weight checks for children under age 3, which take place at the posyandu, and attendance at nutritional group counseling sessions (kelas ibu hamil and kelas balita), which are often held at the posyandu (Olken et al. 2018). In the kabupaten that were the lowest performing at baseline, Generasi also increased child immunization rates and vitamin A distribution. However, Generasi had no impact on the

<sup>7</sup> In our earlier literature review (Beatty et al. 2014), we included a section on micronutrients that we exclude here since that aspect of the Project was not implemented.

<sup>8</sup> The impact results discussed were presented in an academic paper (Olken et al. 2013) and two World Bank reports (Olken et al. 2012, 2018). We consistently cite the 2012 and 2018 reports as they are the most comprehensive summary of findings.

proportion of underweight, stunted, or wasted children, nor on child mortality, and it did not sustain impacts on increasing the number of iron pills distributed to pregnant women. Table 2.1 below provides an overview of the impact of Generasi on the ten health indicators that the Project targeted.

An accompanying qualitative study of Generasi (Grayman et al. 2018), concluded that the program had a positive impact on desa governance, by encouraging desa to allocate funds for health and education in their budgets. However, there were fewer efforts targeted at service providers such as puskesmas staff, resulting in little impact on service delivery. The authors posit that this weak effect on the supply-side may help explain Generasi's limited impact on long-term health outcomes.

**TABLE 2.1 GENERASI IMPACT ON HEALTH INDICATORS, LONG-TERM IMPACT EVALUATION**

Targeted program indicators	Generasi impact	Control mean
Number of prenatal visits, among mothers who gave birth in the last 24 months	0.0 more visits	8.5 visits
Percentage of deliveries with a trained bidan or doctor, among mothers who gave birth in the last 24 months	0.7 percentage point increase	92.2 percent
Number of postnatal visits within 42 days after delivery, among mothers who gave birth in the last 24 months	0.0 more visits	1.8 visits
Number of iron pill sachets distributed to pregnant women, among mothers who gave birth in the last 24 months <sup>a</sup>	0.0 fewer sachets	2.2 sachets
Percent of recommended immunizations up to 11 months, among children 0–23 months old	0.2 percentage point increase	82.5 percent
Number of weight checks in the past three months, among children 0–3 years old	0.1*** more weight checks	2.3 weight checks
Number of vitamin A supplements distributed in past 18 months, among children 6 months to 2 years old	0.1 more supplements	1.4 supplements
Percent of children underweight, among children under 3 years old	0.1 percentage point increase	17.7 percent
Percent attended kelas balita, among parents with a child under 5 years old	8.5*** percentage point increase	11.6 percent
Percent of pregnant women who attended kelas ibu hamil, among women who had been pregnant in the last 24 months	7.9*** percentage point increase	32.3 percent

<sup>a</sup> One sachet contains 30 pills.

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level

Source: Olken et al. 2018, appendix Tables 4 and 6

Turning to the general CDD literature, Wong (2012) provides a review of all experimental or quasi-experimental impact evaluations of World Bank-supported CDD programs (17 evaluations in total). While several of these evaluations measured the project's impact on health and/or nutrition, among other outcomes, only three (Generasi, the *Programme Nationale d'Infrastructures Rurales* [PNIR] in Senegal, and the Nicaragua Emergency Social Investment Fund [FISE]) measured the project's impact on long-term child nutrition indicators such as underweight or stunting.

PNIR in Senegal—which comprised block grants for water supply projects, schools, health centers and health posts, livestock projects, promotion of women’s activities, agriculture, youth and sports, and commerce—increased height-for-age z-scores by 0.3 to 0.4 standard deviations through improved access to clean water and health facilities. This impact was twice as large among poor households. PNIR also improved weight-for-age z-scores by 1 standard deviation among poor households (Arcand and Bossale 2011).

Nicaragua FISE—which used block grants to deliver education, health, and water supply and sanitation infrastructure to the poorest regions of the country—decreased the incidence of stunting from 25 percent to 14 percent among children under 6 years old through expanded access to piped water. There were no statistically significant impacts on wasting, underweight, or diarrhea as a result of water or sanitation projects (World Bank 2000).

To the best of our knowledge there has only been one additional World Bank CDD project focused on nutrition since Wong’s 2012 review—the Community Driven Nutrition Improvement project in Timor-Leste. This project specifically aimed to improve nutrition for children and pregnant and lactating women through community education, but it was not evaluated (World Bank 2019).



**IYCF training.** As part of the Nutrition Project, health service providers at the puskesmas and desa levels received training on IYCF best practices. The intent of these trainings was to improve providers’ knowledge about these practices, as well as their counseling skills, so that they could better counsel mothers and caregivers through regular puskesmas and posyandu visits, nutritional counseling sessions, and other outreach activities.

De Jesus and coauthors (2016) reviewed 17 impact evaluations of interventions to train health providers to support best breastfeeding practices. Eight of these evaluations were in developing countries (Brazil, India, Mexico, and Nigeria) and all eight significantly increased the knowledge and skills of the health professionals who were trained. Other studies in Bangladesh and India also found that these types of trainings can significantly increase health providers’ knowledge of best feeding practices, although these studies did not measure impacts on patient practices or ultimate health outcomes (Saha et al. 2013; Taksande et al. 2009). Although evaluations that measure the impact of such trainings on breastfeeding practices in developing country contexts are rare, one randomized controlled trial in Brazil found that training hospital staff through a three-week course increased the duration of exclusive breastfeeding (Taddei et al. 2000).

A separate review of initiatives to scale-up exclusive breastfeeding programs in developing countries found that successful provider training programs lasted between 3 full days to 10 part days, were concise and action-oriented, and equipped staff with practical skills and confidence to counsel effectively (Bhandari et al. 2008).<sup>9</sup> High staff turnover and absenteeism were identified as challenges, necessitating the frequent repetition of training.

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<sup>9</sup> The success of a program was determined based on the degree to which it met its own internal monitoring and evaluation targets.

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A systematic review of ten randomized controlled trials evaluating the impact of training on complementary feeding practices found that trainings for health workers increased the daily energy intake, feeding frequency, and dietary diversity of children 6 months to 2 years old (Sunguya et al. 2013).<sup>10</sup> Although Sunguya et al. (2013) focused on energy intake as the primary outcome of interest rather than underweight or stunting, two of the studies they reviewed also measured impacts on weight-for-age z-scores. These interventions in Pakistan (Zaman et al. 2008) and Brazil (Santos et al. 2001) provided healthcare workers with 20 hours of training based on the nutrition counseling component of the WHO's Integrated Management of Childhood Illness training module. In both cases, the trainings improved provider knowledge and communication, increased mothers' recall of advice on complementary feeding, increased the percentage of mothers feeding children recommended foods, and increased weight-for-age z-scores.

To complement our review of the effects of IYCF trainings, below we discuss the broader literature related to the behaviors that were the primary focus of the Project IYCF trainings: breastfeeding and complementary feeding. More specifically, we discuss the importance of these behaviors to child health and nutrition, and the effects of interventions that have attempted to improve these behaviors (including counseling, which was a focus of the Project IYCF trainings).

**Breastfeeding.** Breastfeeding is recommended by the WHO and UNICEF because it provides infants with the nutrients they need to develop and reduces the risk of mortality from infectious diseases. The WHO and UNICEF recommend breastfeeding within one hour of birth (early initiation), without any supplements or water for the first 6 months (exclusive breastfeeding), and the gradual introduction of safe complementary foods from 6 months to 2 years of age (complementary feeding) (WHO 2018a).

Another important benefit of exclusive breastfeeding through 6 months and any breastfeeding of children 6 to 23 months old is a reduction in diarrhea incidence, prevalence, and mortality due to the decreased intake of contaminated liquids or foods (Kramer and Kakuma 2002; Lamberti et al. 2011). As we will discuss further below, greater diarrhea prevalence is associated with higher rates of stunting, suggesting that breastfeeding may decrease stunting rates (Checkley et al. 2008). However, it is unclear whether improved breastfeeding practices and decreased diarrhea incidence actually translate into improved nutritional and growth outcomes for children.

Breastfeeding is very common in Indonesia, as 95 percent of children under age 2 were breastfed at some time (DHS 2018). However, most infants were not breastfed in accordance with the WHO and UNICEF guidelines. Only 57 percent of infants were breastfed within an hour of birth, 52 percent of children under age 6 months were exclusively breastfed, and the median duration of exclusive breastfeeding was only 3 months (DHS 2018).<sup>11</sup>

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<sup>10</sup> The duration of six of these training interventions was not specified. The length of the other four ranged in duration from 20 hours (or five partial days) to two-weeks.

<sup>11</sup> DHS (2018) defines exclusive breastfeeding as no liquids or solids other than breast milk. The median duration of predominant breastfeeding (includes exclusive breastfeeding, breastfeeding plus water, and breastfeeding plus non-milk liquids/juices) in Indonesia is 3.8 months, while the median duration for any breastfeeding is 21.8 months.

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Many studies have found that breastfeeding promotion or counseling interventions, through peer counselors, healthcare centers, or incentive-based education programs have increased the prevalence of exclusive breastfeeding in developing countries (Cresswell et al. 2019; Yotebieng et al. 2015; Haider et al. 2000; Kramer et al. 2001; Davies-Adetugbo 1996). A meta-analysis of exclusive breastfeeding interventions found that programs were most effective at increasing exclusive breastfeeding for 6 months when they included a protocol for provider training, were conducted from the pre- to postnatal period, involved healthcare professionals, and linked the hospital and community (Kim et al. 2018).

However, these increases in breastfeeding do not always result in improvements in long-term outcomes such as the prevalence of diarrhea and undernutrition rates. Bhandari et al. (2003) evaluated a breastfeeding counseling intervention in India and found a 31 percentage point increase in exclusive breastfeeding prevalence, a decrease in the seven-day diarrhea prevalence, but no difference in wasting or stunting. Similarly, a multi-country cluster-randomized trial of promotion of exclusive breastfeeding by peer counsellors in sub-Saharan Africa found that after at least five household visits, rates of exclusive breastfeeding in Burkina Faso and Uganda doubled, but there was no effect on stunting and children in the treatment arms were actually slightly more likely to be wasted (Engebretsen et al. 2014). Another study from India found that although exclusively breastfed infants under 6 months were less likely to be underweight or have had diarrhea than non-exclusively breastfed infants, even the exclusively breastfed were vulnerable to undernutrition (Patwari et al. 2015).

**Complementary feeding.** The WHO and UNICEF recommend continuing breastfeeding until at least age 2 and initiating semisolid food at 6 months because at this age an infant's energy and nutrient needs begin exceeding what is provided by breast milk alone (WHO 2018a; UNICEF 2018). Even with optimal breastfeeding, children may become stunted if they do not receive sufficient dietary diversity and meal frequency after 6 months of age (Black et al. 2008; Agostoni et al. 2008). The prevalence of undernutrition increases in children 6 to 18 months old, after which there is little additional change, indicating that this is a particularly vulnerable period for nutritional status (Michaelsen 2000; Victora et al. 2010).<sup>12</sup>

In Indonesia, 86 percent of children 6 to 8 months old are fed solid or semisolid food; however, the low prevalence of exclusive breastfeeding suggests that initiation of complementary feeding may be taking place earlier than recommended. In addition, only 40 percent of children 6 to 23 months old were fed appropriately based on WHO recommendations for infants and young children, (DHS 2018).<sup>13</sup> Seventy-two percent of children 6 to 23 months old received the

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<sup>12</sup> The period during which complementary feeding should be introduced also corresponds to the stage at which children become more mobile and capable of exploring their environment. Because children in this age range are crawling on the ground (with their hands) and putting objects (including their hands) in their mouths to explore shape and texture, these behaviors can put them at risk of ingesting fecal contamination picked up from their surroundings. Some researchers have hypothesized that this could be another important contributor to stunting among children in this age range (Ngure et al. 2014).

<sup>13</sup> For children 6 to 23 months old who are continuing to breastfeed, the minimum practices are defined as a minimum of two feedings of solid, semisolid, or soft foods per day for infants 6–8 months old and three feedings for children 9–23 months old, and consumption of foods from a minimum of four food groups per day (DHS 2018).

recommended minimum frequency of meals and 60 percent of children received the recommended dietary diversity (DHS 2018).

Complementary feeding interventions can include education on complementary feeding and/or supplementary food (providing in-kind food in food insecure communities).<sup>14, 15</sup> The main Nutrition Project activity that aimed to affect complementary feeding practices was the IYCF training (and subsequent delivery of IYCF training messages by puskesmas staff, bidan, kader posyandu, and kader desa). However, since Generasi funds under the Nutrition Project may be used to purchase supplementary food for households, the Project may also affect complementary feeding through this additional channel. Generasi has been shown to increase the number of days that children received PMT (supplementary food provided to poor families, families with children under age 5, or families with underweight or stunted children), with a larger effect among underweight children (Olken et al. 2018).

A systematic review of the effect of complementary feeding programs analyzed 16 interventions and found that education alone (without the provision of supplementary food) significantly increased consumption of recommended foods, improved height- and weight-for-age z-scores, and reduced stunting rates (Lassi et al. 2013). However, the effect of these programs differed between food secure and food insecure communities. For example, in food secure populations, education on complementary feeding had no impact on stunting, whereas in food insecure communities, education did reduce stunting but provision of supplementary food did not. Taken together, these results suggest that education is an important component of complementary feeding programs, regardless of the level of food security of households and whether or not in-kind food support is provided.

In Indonesia, Block (2004) conducted a study of how mothers' knowledge about nutrition is related to spending on food. He found that these women allocated the same amount of their household budget to food regardless of their knowledge of nutrition; however, mothers with greater knowledge of nutrition allocated substantially larger portions of those budgets to micronutrient rich foods and less on staples such as rice. Though schooling levels partially explained these differences, the study found that additional sources of nutrition education such as the posyandu were also important to building the mother's nutritional knowledge.



**Growth monitoring.** Regular growth monitoring has the potential to contribute to preventing and treating undernutrition and may be a particularly useful approach in rural areas with limited health coverage (Ashworth et al. 2008; Faber et al. 2003).

However, on its own growth monitoring is often not sufficient to improve child nutrition and reduce stunting unless it is combined with a comprehensive nutrition program (Mangasaryan et al. 2011). If children are weighed and measured regularly at the posyandu or puskesmas (as is

<sup>14</sup> Food secure populations are defined as areas in which “all people at all times have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life.” (FAO 2019).

<sup>15</sup> About 60 percent of households in the Nutrition Project were classified as experiencing mild to severe food insecurity. Around a third of households reported worrying about not having enough food and slightly more households reported eating a limited variety of foods. Approximately a quarter reported eating smaller meals than desired and a fifth reported eating fewer meals than desired. Ten percent of households reported going to sleep hungry (Null et al. 2016).

policy but not uniformly practiced in Indonesia) and deemed underweight or insufficiently tall/long, the challenge becomes ensuring that the child receives appropriate follow-up and treatment. The evidence on treatment is mixed; the only proven method to treat stunting is providing lipid-based nutrient supplements (LNS) (Hess et al. 2015; Mangani et al. 2016; Adu-Afarwuah et al. 2007; Phuka et al. 2008a, 2008b), so growth monitoring alone will not reverse stunting.

George et al. (1993) evaluated a health and nutrition education intervention in India in which half of the recipients received nutrition education with growth charts and found no difference in the nutrition outcomes between those who received the charts and those that did not. This suggests that although parents might have known there was a problem, they perhaps needed health workers' support to address it.

In contrast, a more recent randomized control trial in Zambia found that providing parents with full-size growth charts and information about nutrition decreased stunting rates among malnourished children by 22 percentage points, while quarterly community meetings to weigh and measure children and distribute nutritional supplements had no impact on stunting (Fink et al. 2017).



**Iron and folic acid supplements.** The Nutrition Project supported the promotion and distribution of IFA to pregnant mothers by health providers to reduce maternal anemia. Anemia during pregnancy is associated with 40 percent of all perinatal deaths (defined as stillbirths and deaths in the first week of life), and infants born to such mothers have one-half of the normal iron reserves, which can lead to iron-deficient anemia in the child (WHO 2011b). There is also substantial evidence correlating maternal iron deficiency during pregnancy with low birthweight, which is a major risk factor for stunting (Allen 2000; Rasmussen 2001; Rahmati et al. 2017; Knops et al. 2005).

A meta-analysis of studies examining the preventative effect of iron supplementation during pregnancy found that iron supplements reduced the incidence of low birthweight babies by 20 percent (Imdad and Bhutta 2012). Iron supplementation has also been found to have other positive maternal and child health outcomes, including reduced maternal mortality, reduced neonatal mortality, improved maternal mental health, and reduced maternal fatigue (Beard et al. 2005; Black et al. 2013; Imdad and Bhutta 2012; Stoltzfus et al. 2004; Titaly and Dibley 2012). Folic acid supplementation decreases the incidence of neural tube disorders, which can cause stillbirths, neonatal death, and severe disability (Blencowe et al. 2010). Iron and folic acid are often combined in a single supplement for convenience, as was the case in the Nutrition Project.

Despite these benefits, adherence to IFA supplementation regimens is often low. According to the 2018 DHS, while 86 percent of women took iron supplements during the pregnancy of their most recent live birth, only 44 percent consumed supplements for at least 90 days, as recommended. Knowledge of pregnancy-related risks, family/spousal support, and at least four prenatal appointments were associated with increased adherence to IFA supplementation.



**Sanitation.** Several cross-sectional analyses suggest that lack of access to sanitation is associated with poor health outcomes for children, including higher rates of diarrhea and increased mortality (Headey and Palloni 2019; Fink et al. 2011). Evidence on the

relationship between sanitation access and the risk of mild or severe stunting is mixed, with some studies finding statistically significant protective effects of sanitation access on stunting (Spears et al. 2013; Fink et al. 2011) and others finding no effect (Headey and Palloni 2019; Pinkering et al. 2019). Poor sanitation is also hypothesized to cause a chronic inflammatory disorder of the small intestines called environmental enteric dysfunction (EED) (Crane et al. 2015; Humphrey 2009; Lin et al. 2013). EED also contributes to oral vaccine failure, which may partially explain the increased risk of infection in children suffering from undernutrition and implies that boosting immunization coverage might not be sufficient to protect children from life-threatening infections (Naylor et al. 2015). Diarrhea and EED both diminish nutrient absorption in the body, contributing to undernutrition and stunting (Guerrant et al. 1999; Checkley et al. 2008; Crane et al. 2015).

In the Nutrition Project study provinces, about 16 percent of children under age 5 in South Sumatra, 19 percent in Central Kalimantan, and 11 percent in West Kalimantan had diarrhea in the two weeks prior to being surveyed (DHS 2018). The Nutrition Project therefore focused directly on this domain in training the puskesmas sanitarians and kader desa and providing funding to communities to improve sanitation and hygiene practices through the CLTS model. CLTS seeks to build awareness about the health and safety risks inherent in open defecation (OD), invoke a sense of disgust and shame among community members (called triggering), and help communities engage in joint decision-making and planning to become open defecation free (ODF).

There have been several studies on the efficacy of CLTS in ending open defecation and improving child health. Impacts have varied by program, but in general CLTS has been shown to decrease open defecation, and in some cases diarrhea, but has not improved longer-term health outcomes such as stunting. A randomized evaluation in East Java, Indonesia of the Total Sanitation and Sanitation Marketing (TSSM) program, which combined the CLTS model with social marketing of sanitation, demonstrated a 1 percentage point decrease in the seven-day prevalence of diarrhea and a 4 percentage point decrease in open defecation (Cameron et al. 2013a, 2019). The program also modestly increased the rate of toilet construction and decreased the incidence of roundworm infestation by 46 percent. However, these health benefits did not result in changes in weight- or height-for-age z-scores. This study also found that some communities were more successful than others in reducing open defecation, with the less successful characterized by limited resources, lower levels of commitment, lower social capital, and closer proximity to a river. ODF communities had significantly higher access to latrines and cost was the biggest obstacle to building latrines.

In rural Mali, a CLTS program implemented by the government almost doubled latrine coverage from one-third of households at baseline and the rate of self-reported open defecation decreased by almost 25 percentage points among adults and children (Pickering et al. 2015). Although there was no difference in diarrhea prevalence rates between the treatment and control desa, the prevalence of stunting among children under age 5 was 6 percentage points less in treatment desa (35 percent versus 41 percent), with a larger difference among children under age 2.

In contrast, two other studies from different states in India both found that although the government's Total Sanitation Campaign (which consisted of latrine promotion and construction but did not include the triggering component of CLTS programs) led to increases in latrine coverage, there were no effects on diarrhea, parasitic infections, or child undernutrition (Clasen et al. 2014; Patil et al. 2014). Coffey and coauthors (2014) investigated these surprising results in five states in India and found that 40 percent of households with a working latrine still had at least one member who was defecating in the open, suggesting that increased latrine coverage alone is not sufficient to eliminate open defecation, but rather the behavior change approach of CLTS is also needed.



**Communications campaign.** The Nutrition Project included a national nutrition and hygiene communication campaign across the 11 Project provinces to reinforce the best practices detailed under the supply-side activities section, with the intention of spurring behavior change. A qualitative implementation study of the communications campaign estimated that it reached 40 million people through national television; raised awareness about stunting; strengthened government commitment to reduce stunting at both the national and local levels; mobilized local coalitions through meetings, hearings with local parliament, and the distribution of advocacy tools; and educated journalists about the importance of stunting and interventions to reduce stunting (Hall et al. 2018).

A review of mass media interventions for child health found that of 32 evaluations, 26 were successful in changing targeted health behaviors which included antenatal care, vaccination coverage, early initiation of breastfeeding, minimum dietary diversity, consumption of micronutrient rich foods, handwashing with soap, and oral rehydration therapy. The six unsuccessful campaigns were related to oral rehydration therapy, vaccination coverage, water purification, and exclusive breastfeeding. The failure of three of these six campaigns was attributed to weak mass media interventions and low exposure levels. The authors point out that these campaigns are almost always implemented in tandem with other interventions, making it difficult to isolate the independent effects of the communication campaign itself (Naugle and Hornik 2014).

In a review of nutrition communication campaigns in developing and developed countries, Snyder (2007) found that the most successful campaigns in prompting behavior change have focused on fruit and vegetable consumption, fat intake, and breastfeeding. A social marketing campaign in Central Java promoting eggs and dark green leafy vegetables to combat vitamin A deficiency resulted in an 11 percent increase in vitamin A intake for mothers and a 23 percent increase for children 12–36 months old, compared to before the intervention (de Pee et al. 1998).

A review of five international breastfeeding communications campaigns found an average 18 percentage point increase in the prevalence of any breastfeeding (Snyder 2007) and Bangladesh's Alive & Thrive program achieved rapid and significant improvements in exclusive breastfeeding and complementary feeding (compared to baseline) through a mass media campaign combined with individual counseling and monetary incentives for community volunteers who provided IYCF counseling to mothers (Sanghvi et al. 2016). Since the mass media campaign was rolled out at the national level, a comparison group was not available and the impact of the communications campaign cannot be separated from the other components of the intervention.

Communication campaigns focusing on sanitation best practices have had more mixed success, largely dependent on implementation of the campaign. Studies on handwashing and hygiene campaigns in India, Ghana, Bangladesh, and Thailand have found increased knowledge from these campaigns, but saw mixed results on translating that knowledge into behavior, in some cases due to the lack of availability of soap and water (Biran et al. 2009; Scott et al. 2007; Pinfold 1999; Nizame et al. 2013).

## 2.2 Gaps in the literature

In this section we discuss some outstanding questions and gaps in the literature and how this study does or does not contribute to those gaps, by activity, mirroring the structure used above on the literature related to various activities that MCC is supporting through the Nutrition Project.



**Generasi/CDD.** Within the CDD literature, the main gap is evidence on CDD projects' effects on nutrition. The main focus of CDD projects has been funding small infrastructure with the goal of longer-run poverty alleviation rather than explicitly improving nutrition outcomes, with the exception of those projects discussed above, most notably Generasi.

Thus, a gap in the literature is whether and how CDD projects can be an effective mechanism for reducing child undernutrition. The Olken et al. (2012, 2018) studies attempt to answer this question and show that CDD projects may need to be significantly altered in order to affect maternal and child health. The Grayman et al. (2018) report provides insight into the shortcomings of Generasi and recommendations around improved facilitation, community participation, targets, and incentives for future nutrition CDD programs. This evaluation of the Nutrition Project, in a sense, looks at altering Generasi by complementing it with supply-side interventions.

An additional gap in the literature is whether temporary CDD projects can have a lasting effect on how communities prioritize certain issues and/or allocate resources after the financial incentives provided by a CDD project have ended. Our study provides some insight into this question by informing us about community allocation of resources towards health services post-Generasi (as the endline surveys were conducted about a year after Generasi ended).



**IYCF training.** The main gaps in the IYCF training literature are how to design and implement trainings so that they (1) improve health worker knowledge; (2) enable health workers to apply that knowledge; (3) lead to behavior change; (4) are scalable; and (5) are sustainable.

This endline study measures the ability of the Project's IYCF trainings to improve health provider knowledge (the first gap), and examines how providers engaged in one-on-one counseling and the nutritional counseling sessions (the second gap). We also look at whether the training leads to improved maternal and child health outcomes (the third gap). We addressed the scalability question (the fourth gap) in our interim report (Beatty et al. 2018) by looking at the effectiveness of the cascade model. Finally, in determining the extent to which Project IYCF training materials were used after the Project had ended we address questions of sustainability (the fifth gap).



**Growth monitoring.** The growth monitoring literature is still relatively limited and there is a lack of consensus on which (if any) growth monitoring interventions are most effective at treating undernutrition and how they can best be combined with treatment and other nutrition programs. While this study will not provide a definitive answer to these outstanding questions, it does examine the impact of growth monitoring, as one component of a package of nutrition and health services, on stunting and undernutrition.



**Sanitation.** As mentioned above, CLTS (or, more precisely, TSSM) has been rigorously tested in East Java Indonesia, and has been promoted widely by the GoI (Cameron et al. 2013a, 2019). However, there remains a question about context: whether CLTS could be effective in Sumatra or Kalimantan, areas poorer and geographically quite different than East Java. In East Java, CLTS was less successful among poorer households and in communities with lower social capital where fewer toilets were built. This study provides MCC and the GoI with evidence on the effectiveness of the MCA-I-modified CLTS training in an off-Java context.

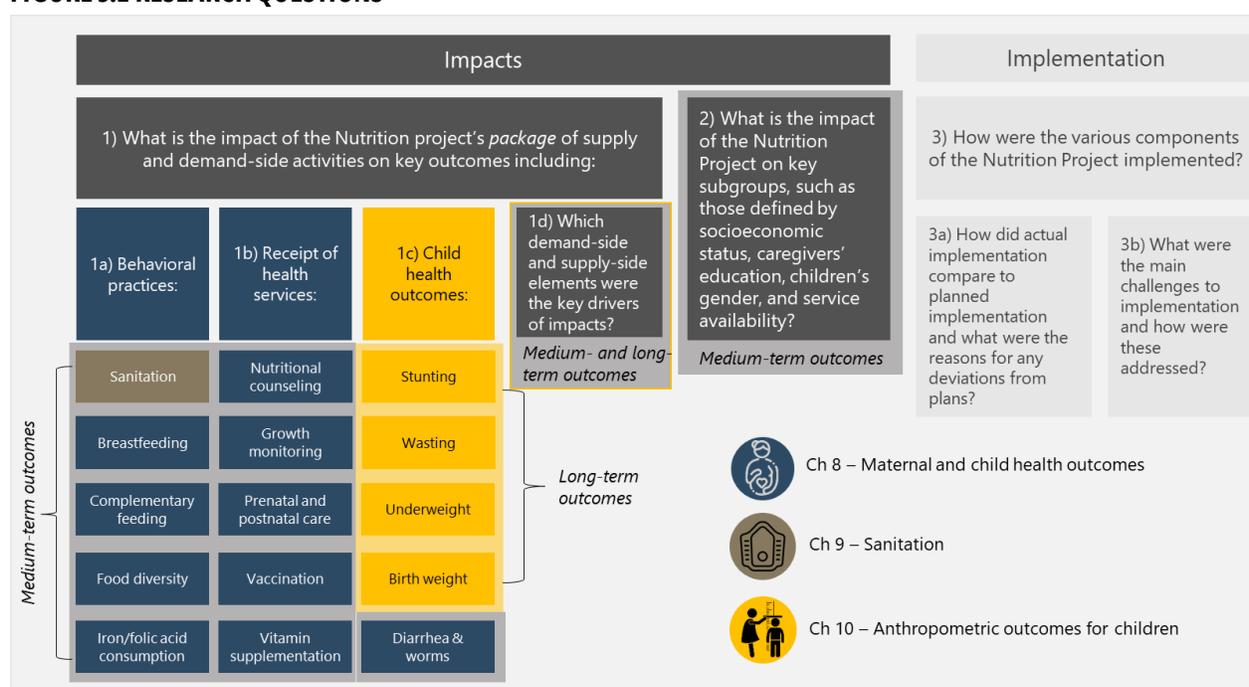
### 3. IMPACT EVALUATION DESIGN

In this chapter we discuss the evaluation research questions and the design we use to answer them—a randomized controlled trial. Specifically, we describe the random assignment procedure, provide motivation for the cohorts and sample sizes that we included at endline, summarize the endline sampling approach, and explain how readers should interpret the results presented in the findings chapters.

#### 3.1 Research questions

The Nutrition Project impact evaluation addresses three key research questions that cover Project impacts and implementation, and are closely aligned with the program logic shown in Chapter 1. The research questions are shown in Figure 3.1.

FIGURE 3.1 RESEARCH QUESTIONS



This endline report focuses mainly on the impact-related questions (questions 1 and 2 above). We largely answered the implementation-related question (question 3 above) in the interim report (Beatty et al. 2018), but we expand on implementation details in this report using the endline survey data. Table 3.1 shows the impact research questions above mapped to the program logic level, and indicates where the corresponding results are in this report.

**TABLE 3.1 IMPACT-RELATED RESEARCH QUESTIONS MAPPED TO PROGRAM LOGIC LEVELS**

Research question number	Assessing Project impact on...	Specifically, these outcomes...	Program logic level	Results presented in chapter(s)
1a	Behavioral practices	Sanitation, breastfeeding, complementary feeding, food diversity, IFA consumption	Medium-term outcomes	8, 9 
1b	Receipt of health services	Nutritional counseling, growth monitoring, prenatal and postnatal care access and utilization, vaccination, vitamin supplementation	Medium-term outcomes	8 
1c	Child health	Stunting, wasting, underweight, low birthweight	Long-term outcomes	10 
1c	Child health	Diarrhea, worms	Medium-term outcomes	9 
1d	Which demand-side and supply-side elements were the key drivers of impacts	Depends on impact findings	Medium-term and long-term outcomes	6, 7, 8, 9, 10 
2	Key subgroups	Key outcomes in chapters 8, 9, 10	Medium-term outcomes	8, 9, 10 

## 3.2 Research design and sample

As mentioned in Chapter 1, we use a randomized controlled trial to rigorously assess the impacts of the Nutrition Project. In 2012, MCC and Project implementers agreed to the design and randomly assigned eligible kecamatan into two groups: those who received the Project activities (the treatment group) and those who did not (the control group) during the evaluation period. Because of random assignment, the treatment and control groups should be similar, on average, in all respects, except that only the treatment group received the Project activities. Therefore, the control group can be used to estimate the counterfactual: the average outcomes that could be expected in the treatment group in the absence of the Project. Any differences in outcomes between the treatment and control group that are observed after random assignment can thus be attributed to the impact of the package of activities implemented under the Project.

### 3.2.1 Random assignment details

The random assignment procedure involved three stages: identifying eligible kecamatan across 22 kabupaten, randomly selecting 225 of the 234 eligible kecamatan for random assignment, randomly assigning these kecamatan into groups of 95 control and 130 treatment, and randomly selecting 95 of the treatment kecamatan for inclusion in the study.<sup>16</sup> (We describe this procedure

<sup>16</sup> The total number of treatment kecamatan (130) was determined based on implementation targets, whereas the number of treatment kecamatan included in the study (95) was determined based on anticipated sample size needs.

in more detail in the design report [Beatty et al. 2014].) This procedure resulted in a sample of 95 treatment and 95 control kecamatan for the study. An implicit stratification procedure ensured that this sample was balanced across the kabupaten in the study.

### 3.2.2 Treatment exposure, sampled cohorts, and sample sizes

At the design report stage, we proposed a sample that included two primary populations—women in the second or third trimester of pregnancy and young children age 0–35 months—because the majority of Nutrition Project activities were intended to directly support children for a period of 1,000 days, starting at conception through age 2.<sup>17</sup> Given that the key Project outcomes were focused on populations at a particular stage in life, we planned to use a repeated cross-sectional sample, whereby we would draw a different random sample of pregnant women and young children at baseline and endline.

Because of the repeated cross-sectional sample and the fact that the baseline and endline surveys served slightly different purposes, we separately assessed the optimal sample sizes required at the two points in time. The purpose of the baseline was primarily to assess equivalence of the treatment and control groups; we determined that a targeted sample size of 1,520 pregnant women and 3,040 young children in the 0–35 month age range (4,560 households in total) was sufficient for this purpose. For endline, where the purpose was to estimate Project impacts, we initially planned to focus on the same populations, but to draw a larger sample (3,040 pregnant women and 6,080 children age 0–35 months) to provide sufficient precision for the planned impact estimates and subgroup analyses.

Our initial plans were based on the premise that different Project activities would be synchronized to have the maximum impact on cohorts of children who would benefit from various activities in the 1,000 days from pregnancy through age 2. However, as discussed in Chapter 1, the expected synchronicities did not materialize due to several activity delays and, in some cases, cancellation of planned activities. The change in Project implementation meant that Project exposure varied substantially across cohorts of children, which led us to adjust the endline sampling strategy.

Table 3.2 shows the intensity of Project exposure by birth cohort. Using the information in this table, we recommended that MCC focus more resources on data collection for children born in 2016, who were 24–35 months old at the time of endline data collection, because they would have received maximum exposure to the Project. Specifically, the 2016 birth cohort would have been exposed to up to three years of Generasi implementation and they could experience the effects of IYCF, growth monitoring, and sanitation training for two years of life.

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<sup>17</sup> We proposed including children 0–35 months old rather than 0–23 months old because children 24–35 months old at endline would have been exposed to the Project during part of the 1,000 day window.

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**TABLE 3.2 BIRTH COHORT AND INTENSITY OF PROJECT EXPOSURE**

	Born 2018	Born 2017	Born 2016	Born 2015	Born 2014
Age at start of 2019 (endline)	0-11 months	12-23 months	<b>24-35 months</b>	36-47 months	48-60 months
Exposure to Generasi implementation	Minimal (most activities had stopped by 2018)	Potentially 1-2 years (winding down by 2017)	<b>Up to 3 years</b>	Potentially 1-2 yrs	Potentially 0.5 years
Exposure to effects of IYCF, growth monitoring, and sanitation training	1 year (although no active training implementation)	2 years	<b>2 years</b>	IYCF and growth monitoring: 1-2 yrs Sanitation: 1 year	Too soon for most training effects
Treatment-control contrast in exposure	Minimal contrast	Moderate contrast	<b>Maximum contrast</b>	Moderate contrast	Minimal contrast

Therefore, we drew a relatively large sample of 4,560 children 24–35 months old at endline, which we complemented with a smaller sample of 3,040 children 0–11 months old (to capture pregnancy and newborn care behaviors) and 1,520 children 12–23 months old (to round out the sample of children to cover the full 0–35 month age range). This amounted to a sample size of 9,120 households. Table 3.3 summarizes the rationale for including each age group, the targeted sample size for each, and the minimum detectable impacts (MDIs) that motivated these sample sizes.

**TABLE 3.3 AGE GROUPS FOR THE ENDLINE SAMPLE: RATIONALE, SAMPLE SIZES, AND MINIMUM DETECTABLE IMPACTS**

Age group (age at endline)	Rationale for including in sample	Targeted endline sample size	Minimum detectable impacts
0–11 months	This cohort enables us to capture both pregnancy and newborn care behaviors using the same sample with an acceptably short recall period. Because these behavioral outcomes would mainly be affected by the trainings—which should continue to affect new pregnant women and new mothers in the treatment areas—this sample should have sufficient exposure for impacts to manifest.	3,040	<b>2–9 percentage points</b> for behavioral outcomes. We believe that these MDIs are sufficient because large changes in these outcomes would be required for substantive changes in health outcomes to occur.
12–23 months	This cohort rounds out the sample of children to cover the full 0-35 month age range. With appropriate weighting, we are able to detect impacts across the full age range from 0-35 months.	1,520	This sample size for the 12-23 month old range was intended to round out the sample that enabled us to measure a <b>4.7 percentage point</b> change in stunting for the full 0–35 month age range.
24–35 months	This cohort would have received maximum exposure to the program.	4,560	This sample size was intended to enable us to measure a <b>5.6 percentage point</b> change in stunting for this cohort.

Due to implementation conditions, we also recommended dropping the sample of pregnant women that we originally proposed surveying at endline, for several reasons. First, it seemed

unlikely that the IFA funded by MCA-I would still be distributed and consumed in treatment desa by the time of the endline survey, so we did not expect impacts on anemia for women who were pregnant at endline. (This logic also applies to measuring child anemia which we did not do at endline.) Second, MCC already funded a separate study to look at the effectiveness of IFA distribution (Abt 2018), so there seemed no need to examine this in the impact evaluation. Third, one main purpose of surveying pregnant women was to capture their pregnancy behaviors; however, we planned to accomplish this more efficiently using the sample of households with children age 0–11 months described above by asking respondents to recall behavior during their pregnancy. An implication of omitting the pregnant women sample for the endline analysis was that we were no longer able to measure MUAC, which might have improved through greater provider access (through *Generasi*) or counseling sessions (*kelas ibu hamil*).

### 3.2.3 Sampling approach

We discuss the sampling procedures in detail in Appendix A. In summary, at baseline, MCA-I randomly selected four desa in each treatment and control kecamatan into the sample to act as the primary sampling unit (PSU) for the household sample. The same desa remained the PSU for the endline data collection. (SurveyMETER, the local data collection firm contracted by Mathematica, added additional randomly sampled desa in a few cases where the original four desa did not have a sufficient number of children to meet endline sample targets.)

SurveyMETER also selected the secondary sampling unit (SSU) in each desa, depending on the administrative level appropriate to the context (these units were typically *dusun*, *RT*, or *RW*). SurveyMETER developed a list of all the SSUs in each desa with the help of the *kepala desa* (village head), and randomly selected one. Within the selected SSU, SurveyMETER conducted a listing of households and drew the sample of respondents from this listing. The goal for endline data collection was to sample and interview 12 households in each desa: 4 households with a child 0–11 months old, 2 households with a child 12–23 months old, and 6 households with a child 24–35 months old.

As discussed in Chapter 4, SurveyMETER also interviewed a variety of health service providers, as well as desa and kabupaten administrators, at endline. For health service providers, SurveyMETER generally attempted to interview the providers that served the household sample. Specifically, the targeted sample of kader posyandu comprised all kader posyandu who served posyandu in the selected SSUs, and the targeted sample of bidan comprised bidan who served the selected desa (PSUs). For puskesmas-based providers—bidan coordinators, nutritionists, and sanitarians—SurveyMETER identified the puskesmas serving the selected desa (typically, but not always, one puskesmas served all desa in the kecamatan). Finally, the sample of desa administrators worked in the desa administrations in the selected desa, and the sample of kabupaten administrators worked in the 22 kabupaten that were part of the study.

Because the sample of desa (PSUs) at endline was almost identical to that at baseline, some providers and desa administrators interviewed at endline would also have been interviewed at baseline. However, given the potential for staff turnover between baseline and endline, the provider and desa administrator samples should be viewed as a geographic panel (covering the same areas at baseline and endline) rather than an individual panel (covering the same

individuals). We take this aspect of the data into account in our analysis approach, described in Chapter 4.

### 3.2.4 Results interpretation

Throughout this report, we focus on reporting endline levels for the treatment group—where the Project was active—and highlighting differences with the control group, if any. These differences capture the combined impact of the *package* of interventions that was implemented in the treatment kecamatan but not in the control kecamatan. To the extent possible, we attempt to assess which demand- and supply-side interventions were the more likely drivers of overall impacts (research question 1d) by examining outcomes linked to specific interventions, combined with our knowledge of implementation. However, we are unable to quantitatively disentangle the effects of specific activities on the overall impact estimates.

Further, as we anticipated in Chapter 1 of this report, the evaluation design implies that the impact estimates do not cover certain Project activities. One of these is the national-level communications campaign, which affected treatment and control communities equally and therefore could not be evaluated using our proposed methodology. We also could not evaluate the sub-national level of the communications campaign, because it was implemented only in 11 purposively-selected kabupaten within the evaluation areas (again, without distinguishing between treatment and control kecamatan). Finally, we were unable to evaluate the sanitation grant-making activity—which funded three localized sanitation-related projects—using our proposed methodology.

## 4. DATA SOURCES AND ANALYTICAL APPROACHES

Most of the analysis in this report is based on in-person surveys conducted with a range of respondents at the household, desa, kecamatan, and kabupaten levels at endline, in early 2019. For our analysis of Generasi (Chapter 6), we complemented these surveys with administrative information from a database of desa-level Generasi activities and spending from the Ministry of Villages, Disadvantaged Regions, and Transmigration, and a more recent database on desa-level spending on stunting prevention activities from Bappenas. In this chapter we describe these data sources in further detail and discuss the analyses that we conducted for this report.

### 4.1 Data sources, survey respondents, and response rates

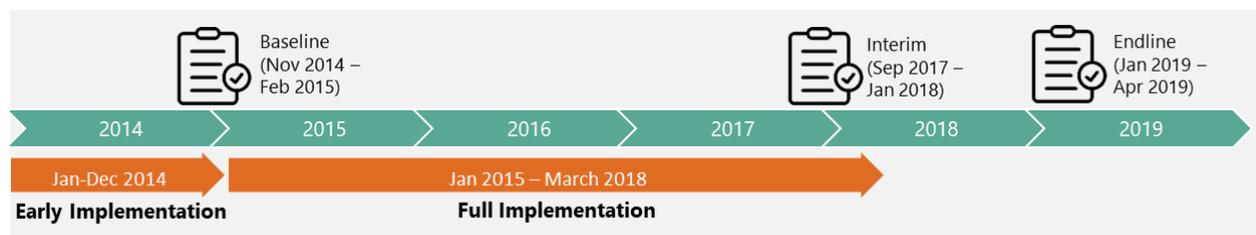
Here we discuss the timing and contents of the endline surveys, and briefly describe the Ministry of Villages Generasi and Bappenas databases. We also describe the respondents to the endline surveys and report the survey response rates.

#### 4.1.1 Data sources

##### *Surveys with households, health service providers, and government administrators*

Figure 4.1 shows the timing of data collection relative to Project implementation. Early implementation comprised Generasi facilitator training, initial Generasi grant distribution, and IYCF training of trainers. Baseline data collection was conducted before implementation of most Project activities had started, and comprised in-person quantitative surveys.<sup>18</sup> Interim data collection comprised in-depth interviews and focus groups with stakeholders involved in and targeted by Project activities, field observations, and a phone survey of health providers. Endline data collection, which is the primary data source for this report, was conducted about a year after implementation ended, and comprised in-person quantitative surveys similar to those implemented in the baseline round. SurveyMETER, an Indonesian data collection and research firm, undertook all data collection, with the exception of the interim phone surveys, which RTI International conducted.

**FIGURE 4.1 DATA COLLECTION TIMING**



<sup>18</sup> Two Project components had started at the time of the baseline survey: initial activities for Generasi, and IYCF provider training (training of trainers). However, no desa had started activities to improve progress on Generasi indicators, and few desa and puskesmas level staff had received the official IYCF training prior to baseline data collection.

SurveyMETER administered the endline surveys to households (household heads and child caregivers), health service providers (kader posyandu, bidan, bidan coordinators, nutritionists, and sanitarians), as well as staff from the desa and kabupaten administrations. (Table 4.1 summarizes the respondents, survey contents, and sample sizes for the endline surveys; for reference, it also summarizes the sample sizes for the equivalent baseline surveys.) These surveys were almost exclusively quantitative in nature, but the kabupaten administration surveys also included several open-ended questions. As part of the endline caregiver survey, trained enumerators also measured the weight and length of the sampled child in each household. We use the endline survey data to estimate the impacts of the Project by comparing outcomes in the treatment and comparison areas, as we discuss below.

**TABLE 4.1. SUMMARY OF ENDLINE SURVEYS**

Respondent	Level	Survey content	Baseline sample size	Endline sample size
Household head	Household	Background characteristics of household members, dwelling, assets, receipt of social benefits, water and sanitation conditions	3,546	9,120
Caregiver	Household	Maternal and child health outcomes such as health care utilization during and after pregnancy, breastfeeding and complementary feeding, and knowledge of caregiving practices; weight and length measurement for children 0–35 months old	2,487 <sup>a</sup>	9,120
Kader posyandu	Sub-desa	Training experience, job responsibilities, posyandu operations, health care knowledge and practice, interaction with Generasi	732	898
Bidan	Desa	Training experience, job responsibilities, health care knowledge and practice, interaction with Generasi	570	783
Bidan coordinator	Kecamatan/ Puskesmas	Training experience, puskesmas operations, job responsibilities, health care knowledge and practice, interaction with Generasi	245	242
Nutritionist	Kecamatan/ Puskesmas	Training experience, puskesmas operations, job responsibilities, health care knowledge and practice, interaction with Generasi	214	242
Sanitarian	Kecamatan/ Puskesmas	Training experience, job responsibilities, CLTS implementation experience, sanitation knowledge and practice, interaction with Generasi	203	240
Desa administration	Desa	Background information about the desa, desa health service availability, CLTS implementation, Generasi implementation, desa spending	760	784
Kabupaten administration	Kabupaten	IYCF and CLTS training implementation, Generasi implementation, social benefit programs available in the kabupaten, perceptions of Nutrition Project	n.a.	22

<sup>a</sup>The baseline sample size for household heads is larger than that for caregivers because the baseline household sample included some households with pregnant women rather than caregivers of young children.

n.a = not applicable because we did not conduct this survey at baseline.

### *Ministry of Villages and Bappenas databases*

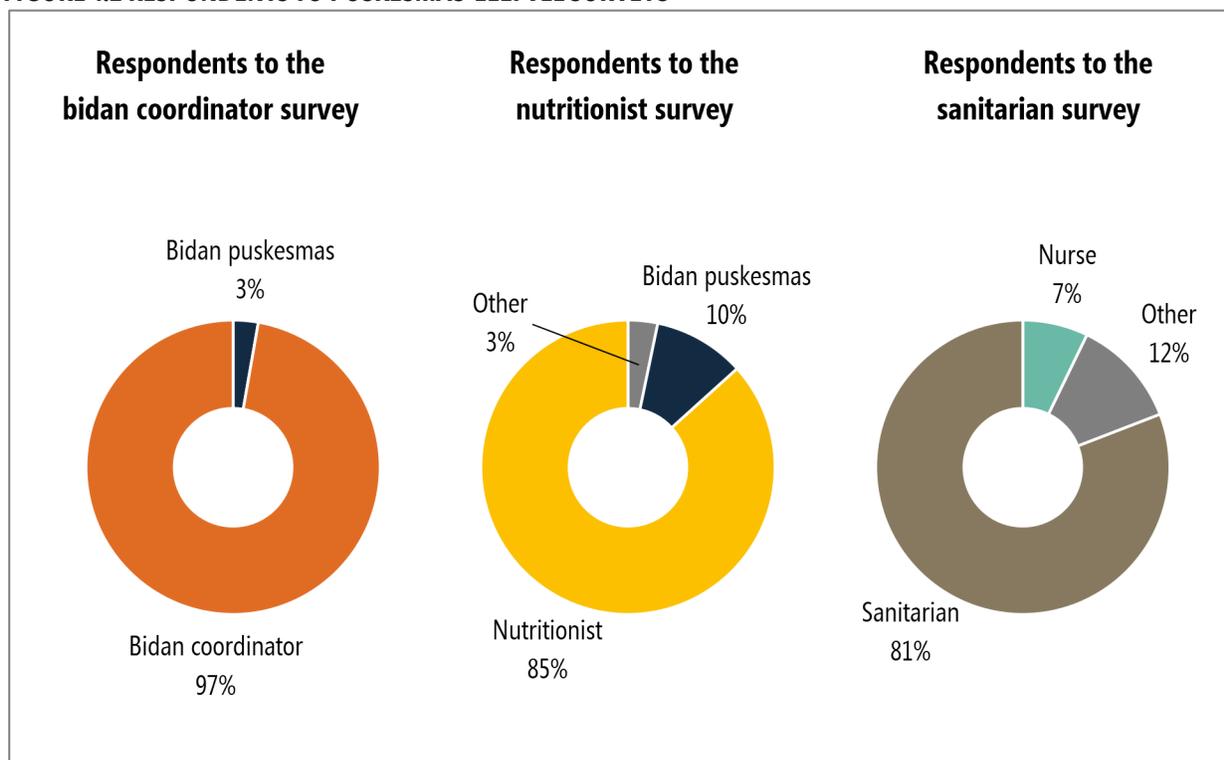
We relied on two data sources for information on Generasi spending by activity type. In our analysis for the interim report, we used a database from the Ministry of Villages, Disadvantaged Regions, and Transmigration that provided detailed information about how Generasi funds were spent in the eight non-evaluation provinces from 2012 to 2016 and in the three evaluation provinces for 2014 to 2017. Determining what would be the comparable dataset for 2018 was challenging since Generasi had ended. MCC acquired 2018 data from Bappenas on “stunting prevention activities” from the *Anggaran Pendapatan dan Belanja Desa* (APBDesa), or desa-level revenue database. Using these two databases, we are able to look at spending over time on a subset of activities included in both datasets.

#### **4.1.2 Survey respondents**

The household head and caregiver of the sampled child were the respondents to the household and caregiver survey, respectively. Similarly, the kader posyandu who served the sampled households were the respondents to kader posyandu surveys. However, respondents to the other surveys sometimes held different roles from those targeted by the survey. Almost one in five respondents to the bidan survey were not bidan desa, but rather bidan coordinators, other private bidan, or nurses who were taking on the bidan desa’s responsibilities because there was no bidan desa at endline (SurveyMETER 2019).

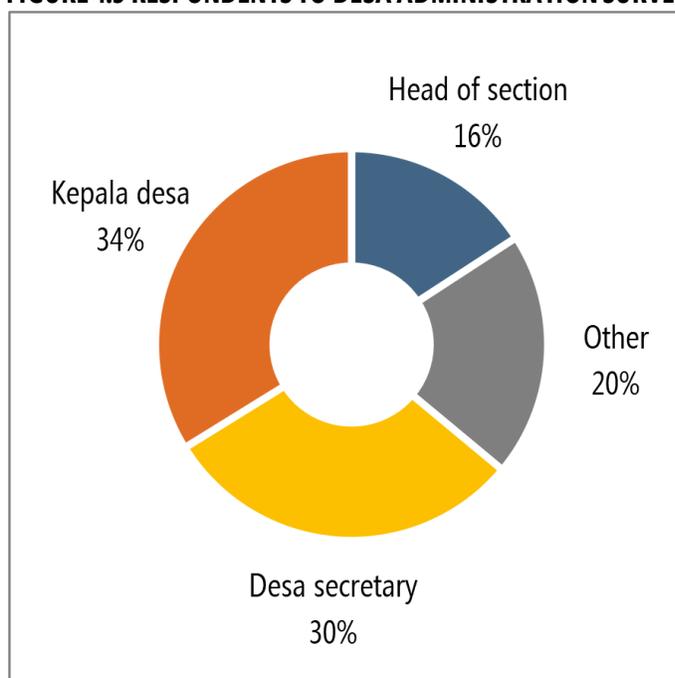
The respondents to the puskesmas-level surveys also sometimes varied in the positions they held because some puskesmas did not have bidan coordinator, nutritionist, and/or sanitarian positions. In these cases, SurveyMETER interviewed the puskesmas provider who was taking on similar duties. The respondents to the desa and kabupaten administration surveys also varied, depending on which administrative staff were available and knowledgeable about the topics we were interested in. (Details about the respondents to these surveys are in Appendix B Tables 4.1–4.3.)

Figure 4.2 summarizes the respondents to the puskesmas-level surveys. In treatment areas, almost all puskesmas had a bidan coordinator position, but about 15 percent did not have a nutritionist position (in most of these cases, a bidan was taking on these responsibilities and responded to the survey), and about 19 percent did not have a sanitarian position (a variety of other staff were taking on these responsibilities and responded to the survey). This pattern was very similar in control areas, suggesting that the type of respondent is unlikely to affect comparisons in outcomes between the treatment and control groups.

**FIGURE 4.2 RESPONDENTS TO PUSKESMAS-LEEFVEL SURVEYS**

Source: Bidan coordinator, nutritionist, and sanitarian surveys  
 Sample size: 242 bidan coordinators, 242 nutritionists, 240 sanitarians

The respondents to the desa administration survey were highly variable (Figure 4.3). In treatment areas, about one-third of respondents were the kepala desa, another one-third were the desa secretary, and the rest were split between the heads of sections within the desa administration and other types of respondents. Respondents were slightly more likely to be the kepala desa in control areas (by a marginally significant 6 percentage points), but the difference is modest and unlikely to affect estimated impacts on desa-level outcomes.

**FIGURE 4.3 RESPONDENTS TO DESA ADMINISTRATION SURVEY**

Source: Kepala desa survey  
 Sample size: 1,167 kepala desa officials

Finally, the kabupaten respondents represented various positions in the *Dinas Kesehatan Kabupaten*, District Health Office (DHO), the *Dinas Pemberdayaan Masyarakat dan Desa Kabupaten* (District Community and Village Empowerment Office), and the *Dinas Sosial Kabupaten* (District Social Affairs Office).

### 4.1.3 Response rates

The responses rates to the endline surveys were high (Table 4.2). For households and caregivers, the overall response rate was about 90 percent, and was almost identical in the treatment and control groups. For other types of respondents, the response rate in both the treatment and control groups was 100 percent, or very close. The high response rates in both the treatment and control groups suggest that differential non-response bias—which would occur if certain types of individuals were more likely to respond to the survey in one group—is unlikely to affect the estimates presented in this report.<sup>19</sup>

<sup>19</sup> For each type of respondent we define the response rate as the percent of attempted interviews that were completed. At the household level, SurveyMETER made three attempts to interview the first-sampled household and then replaced if the household refused or if they were unavailable. At the provider level, SurveyMETER sought to interview the person responsible for the role.

**TABLE 4.2 RESPONSE RATES AND SAMPLE SIZES FOR ENDLINE SURVEYS**

Respondent	Control sample size	Control response rate (percent)	Treatment sample size	Treatment response rate (percent)	Total sample size	Total response rate (percent)
Households and caregivers	4560	89.9	4560	89.9	9120	89.9
Kader posyandu	446	99.8	452	99.8	898	99.8
Bidan	391	100	392	100	783	100
Bidan coordinator	121	100	121	100	242	100
Nutritionist	121	100	121	100	242	100
Sanitarian	119	98.4	121	100	240	99.2
Desa administration	392	99.8	392	99.8	784	99.8
Kabupaten administration	n.a.	n.a.	n.a.	n.a.	22	100

Source: Household, caregiver, bidan, kader posyandu, bidan coordinator, nutritionist, sanitarian, desa, and kabupaten endline surveys  
n.a. = not applicable because each kabupaten covers both treatment and control areas.

## 4.2 Analyses

Below we describe the types of analyses we conducted to create the findings for this report based on (1) survey data and (2) the Generasi and desa-level revenue databases.

### 4.2.1 Quantitative analyses

Given the use of random assignment, the basic method to estimate impacts is to compare the mean outcomes of the treatment and control groups at endline. We instead used multivariate regression models to estimate impacts because they provide greater analytic flexibility. The regression adjustment enabled us to account for design characteristics such as the implicit stratification of random assignment by kabupaten, account for differences between the treatment and control groups that arise by chance, and improve statistical precision through the inclusion of additional control variables.

For households and caregivers, we compared endline outcomes between the treatment and control areas by estimating the following multivariate ordinary least squares model:<sup>20</sup>

<sup>20</sup> In the case of a binary outcome (for example, whether a child is stunted), equation (1) is termed a linear probability model. Although probit or logit models are often used for binary outcomes, we prefer a linear probability model because it is easier to interpret and relies on weaker parametric assumptions. In practice, probit or logit and linear probability models generally yield similar results for the types of marginal effects that we are estimating here (Angrist and Pischke 2008; Wooldridge 2010).

$$Y_{ij, \text{endline}} = \alpha + \beta T_j + \gamma \bar{Y}_{j, \text{baseline}} + \lambda X_{ij} + \delta_j + \varepsilon_{ij} \quad (1)$$

where  $Y_{ij, \text{endline}}$  is the outcome for individual  $i$  in kecamatan  $j$  at endline;  $T_j$  is a binary variable denoting treatment kecamatan;  $\bar{Y}_{j, \text{baseline}}$  is the baseline mean of the outcome at the kecamatan level;<sup>21</sup>  $X_{ij}$  is a vector of individual socio-demographic control variables (whether the respondent completed junior secondary school, wealth quintile, mother's age when the sampled child was born, birth order of the sampled child, and the sampled child's gender);  $\delta_j$  is a set of binary variables for kabupaten (the level of implicit stratification for random assignment); and  $\varepsilon_{ij}$  is an individual error term. The estimate of the parameter  $\beta$  is the regression-adjusted estimate of the average impact of the package of activities implemented under the Project.

Because the sample of interest consisted of children in a specific age range (0–35 months old) at the time of the survey, we measured key outcomes for different individuals at baseline and endline. Therefore, individual-level baseline measures of the outcomes are not defined for the endline sample. Instead, we adjusted for the baseline mean of the outcome at the kecamatan level—the level of random assignment—by including the term  $\bar{Y}_{j, \text{baseline}}$  in equation (1).

Conceptually, this is similar to a kecamatan-level difference-in-differences approach that compares the change in outcomes in the treatment kecamatan between baseline and endline to the same change in control kecamatan. Including the baseline kecamatan-level mean as a control variable in a regression framework instead of computing the difference-in-differences is a more flexible approach that allows the relationship between the endline and baseline means to be determined empirically. As mentioned above, this approach enabled us to adjust for any baseline differences between the treatment and control groups that arose by chance and improved the precision of the estimates.

Our estimates also accounted for the fact that outcomes among individuals in the same kecamatan—which is the level of random assignment—are likely to be correlated, because they experience many of the same conditions (most importantly, having access to the same puskesmas, a nexus of the Project). We accounted for this correlation statistically by clustering the regression error terms at the desa level to adjust the standard errors. In addition, we included weights to adjust for the different sampling and random assignment probabilities to ensure that our estimates were fully representative of the sample kecamatan and that the comparison of average outcomes between respondents in the treatment and control kecamatan was valid. (Appendix A discusses how we constructed these weights.)

For subgroup analyses, we restricted the sample in equation (1) to the relevant subgroup (for example, caregivers who had completed junior high). In the findings chapters, we only report impacts for subgroups for outcomes where (1) the impact for that subgroup is statistically significant; and (2) the difference in impacts across subgroups is statistically significant (for example, the impact for caregivers who had completed junior high is significantly different from

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<sup>21</sup> In some cases the outcome was not measured at baseline and we omit this term.

the impact for caregivers who had not completed junior high). This approach enables us to isolate the most meaningful subgroup impacts.

For providers (kader posyandu, bidan, and puskesmas providers) and the desa administration, we estimated a very similar model to (1), except with different control variables (Table 4.3). Similar to the household and caregiver analyses, we clustered standard errors by kecamatan and used appropriate weights to ensure that the results are representative of the target areas.

Finally, our analysis of the kabupaten administration surveys was largely descriptive, because kabupaten cover both treatment and control areas. The kabupaten administration surveys also had some open-response questions which prompted lengthy descriptive answers. We used qualitative analysis methods to identify key themes and assess similarities and differences in responses across kabupaten.

**TABLE 4.3 CONTROLS IN REGRESSION ANALYSES**

Respondent	Control variables						
	Age	Years of experience	Gender (binary)	Lives and works in same desa (binary)	Lives and works in same kecamatan (binary)	Completed senior secondary school (binary)	Number of years has lived in the desa
Kader posyandu	X	X		X		X	
Bidan	X	X		X			
Bidan coordinator	X	X			X		
Nutritionist	X	X			X		
Sanitarian	X	X			X		
Desa administration	X	X	X				X
Households and caregivers	Binary for whether mother completed junior secondary; binaries for each SES quintile; binaries for birth order (first born, second born, third or later); mother's age at child's birth; ethnicity of the household head (binaries for Dayak, Javanese, and Melayu); binary for child gender						

Note: All regressions controlled for the baseline kecamatan-level mean (where available) and included binaries for kabupaten.

#### 4.2.2 Analysis of Ministry of Villages and Bappenas databases

Each desa-level activity implemented using Generasi funds listed in the Ministry of Villages data was categorized by the Ministry into one of three categories: health, education, or early childhood education and development (*Pendidikan Anak Usia Dini*, or PAUD). Within these sector categories, the database broke activities down into over 100 activity categories, which we aggregated into 36 categories. To compare spending using the 2018 Bappenas data, we examined which if the 100 categories from the Ministry of Villages data were aligned with the 19 categories included in the Bappenas data. Thus we were only able to compare spending across 13 categories common to both datasets.

## 5. OVERVIEW OF HOUSEHOLD AND PROVIDER CHARACTERISTICS AND SERVICE ACCESS

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In this chapter we describe the characteristics of the households and health service providers, as well as the availability of health services, in the endline treatment and control samples. These descriptions have two main objectives: (1) to provide context for the analyses of health-related outcomes in subsequent chapters, and (2) to assess the extent to which endline differences in health-related outcomes between the treatment and control group might be driven by differences in group characteristics rather than the impacts of the Project.<sup>22</sup>

### 5.1 Household, caregiver, and child characteristics

In this section we examine the sociodemographic and socioeconomic characteristics of the households, caregivers, and sampled children in the endline treatment and control samples. We present selected characteristics below; we present a more complete set of characteristics in Appendix B Tables 5.1 and 5.2.

**At endline, the treatment and control groups were similar across a range of household, caregiver, and child characteristics.** The vast majority of households in the treatment sample (96 percent) were located in rural areas, with the average household comprising five members, including two children under age 15 (Table 5.1).<sup>23</sup> Almost all household heads were male, with an average age of 38 years, and more than two-thirds identified as Muslim, the predominant religion in Indonesia. About one-half of household heads had completed junior secondary (grade 9) or senior secondary school (grade 12) (Figure 5.1). Just over half of household heads reported that someone in their household had health insurance.

Caregivers, who were almost always the sampled child's mother, were on average 29 years old (Table 5.1). About one-half completed junior secondary school and about one-third completed senior secondary (Figure 5.1), and about 17 percent had worked full time in the last year (at least 30 hours per week, on average).<sup>24</sup> Sampled children were split almost equally by gender and about 3 in 10 were the first-born child in their household. As described in Chapter 3, our endline sample was designed so that the largest age group comprised 24–35 months old children, followed by 0–11 month old children and 12–23 months old children.

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<sup>22</sup> In our baseline report (Beatty et al. 2016) we showed that households and providers in the treatment and control areas were similar in most characteristics at baseline, as expected from random assignment. However, it is necessary to reassess these differences here because the households in our endline sample—as well as some of the providers—are different from the baseline sample.

<sup>23</sup> Throughout this report we generally report treatment means and note if they are statistically different from control means. We do not report the combined treatment and control results since the focus of this report is the impact of the Nutrition Project.

<sup>24</sup> This is the OECD definition of full-time work; there does not appear to be a formal Indonesian definition.

Almost all sociodemographic characteristics of households, caregivers, and sampled children were similar in the treatment and control groups. One potentially important exception is ethnicity, with the treatment group substantially less likely to be Dayak in West Kalimantan (by a marginally statistically significant 10 percentage points) and more likely to be so in Central Kalimantan (by a statistically significant 17 percentage points). If ethnicity is correlated with health outcomes, these differences could bias our impact estimates. To account for this, we included controls for the most common ethnicities (Dayak, Javanese, and Melayu) in the regression analysis models, as described in Chapter 4.<sup>25</sup> Given the similarity between treatment and control groups in most household characteristics, together with the regression controls, household sociodemographic characteristics are unlikely to be driving the estimated impacts of the Project on health-related outcomes.

**TABLE 5.1 DEMOGRAPHIC CHARACTERISTICS OF HOUSEHOLD HEADS, CAREGIVERS, AND SAMPLED CHILDREN**

	Sample size	Control mean	Treatment mean	Adjusted difference
<b>Household head</b>				
Female	9120	4.89	3.9	-0.8
Age (years)	9107	37.9	37.8	-0.1
Muslim	9120	72.4	70.1	0.9
Lives in rural area	9120	87.7	95.5	5.7
South Sumatra ethnicity: Palembang	2064	31.8	25.6	-7.9
West Kalimantan ethnicity: Dayak	3792	53.7	45.2	-9.6*
Central Kalimantan ethnicity: Dayak	3264	54.6	68.0	17.2**
Total household members	9120	4.9	4.9	0.0
Number of children in the household, age 15 and younger	9120	2.1	2.1	-0.0
Any household member has health insurance	9120	58.1	56.9	-2.1
<b>Caregiver</b>				
Caregiver is target child's mother	9120	97.9	98.2	0.4
Age (years)	9116	29.5	29.4	-0.1
Worked >= 30 hrs./week in a typical week in 2018	9115	15.1	16.6	0.9
<b>Sampled child</b>				
Child is 0–11 months old	9120	35.0	34.3	-0.7
Child is 12–23 months old	9120	23.0	24.1	1.1
Child is 24–35 months old	9120	42.1	41.6	-0.4
Child is female	9120	46.6	49.1	2.2
Child is first born	9120	30.7	30.8	0.0

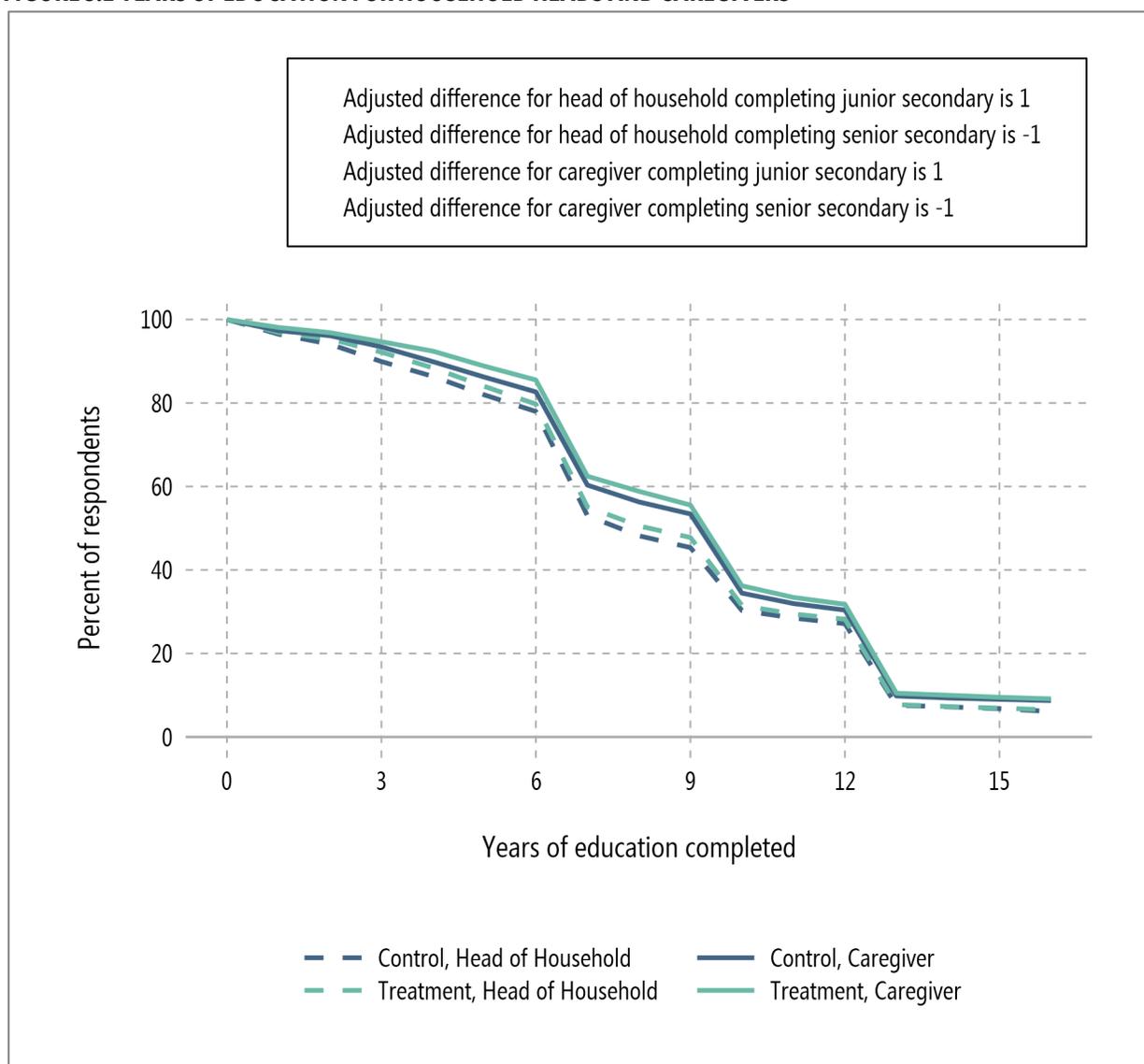
Source: Household and caregiver endline surveys

Note: Results reported in percent unless otherwise indicated.

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

<sup>25</sup> As described in Chapter 4, we also controlled for other characteristics—including mother's age, mother's education, birth order, and the wealth index described below—even though they were balanced in the treatment and control groups, to improve the precision of our impact estimates.

**FIGURE 5.1 YEARS OF EDUCATION FOR HOUSEHOLD HEADS AND CAREGIVERS**



Source: Caregiver and household baseline and endline surveys

Sample size: 9,117 caregivers and 9,103 household heads

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

We also examined a range of household socioeconomic characteristics and assets, which we combined to create a wealth index following the approach of the Demographic and Health Surveys (DHS). The wealth index can be interpreted as a composite measure of a household’s living standards; it enables us to divide households into groups (quintiles) based on their relative wealth, with households in lower quintiles being less wealthy than those in higher quintiles.<sup>26</sup>

<sup>26</sup> Specifically, we conducted a principal components analysis using very similar items to those used by the DHS, and used the coefficients from the first principal component to create the wealth index for each household. We then divided the sample into wealth quintiles based on the distribution of the index in the control group.

Table 5.2 shows a selection of key characteristics that are the most salient for descriptive purposes and/or made a large contribution to the wealth index. More than 90 percent of households in treatment areas had electricity and some assets such as mobile phones, televisions, and motorcycles were very common among these households. In contrast, less than half of treatment households owned a refrigerator or had a bank account. There were some statistically significant differences between the treatment and control group for a small number of specific components of the wealth index—for example, owning a refrigerator was less common in the treatment group. However, the vast majority of components as well as the distribution of the final wealth index were similar in the treatment and control groups. Thus, socioeconomic differences are also unlikely to be biasing the estimated impacts on health-related outcomes.

**TABLE 5.2 WEALTH INDEX CHARACTERISTICS**

	Sample size	Control mean	Treatment mean	Adjusted difference
<b>Key characteristics and assets in the wealth index</b>				
Household has electricity	9120	94.1	94.2	1.0
Household has a television	9120	81.3	78.9	-1.6
Household member has a mobile phone	9120	89.9	87.7	-1.6
Household has a refrigerator	9120	51.1	43.7	-6.8***
Household has a motorcycle	9120	83.4	85.5	1.8
Household member has a bank account	9120	41.1	39.7	-2.2
Number of rooms in house	9120	4.9	4.8	-0.1
Wall material: wood	9120	47.6	46.8	-0.5
Primary cooking fuel: wood	9120	20.9	24.4	2.4
<b>Wealth index</b>				
Quintile 1 (1%–20%)	9120	20.0	19.4	-0.7
Quintile 2 (21%–40%)	9120	20.1	18.4	-1.8*
Quintile 3 (41%–60%)	9120	20.0	22.3	2.3*
Quintile 4 (61%–80%)	9120	20.0	21.2	1.4
Quintile 5 (81%–100%)	9120	20.0	18.8	-1.1

Source: Household endline survey

Note: Results reported in percent. Table only shows selected components of the wealth index.

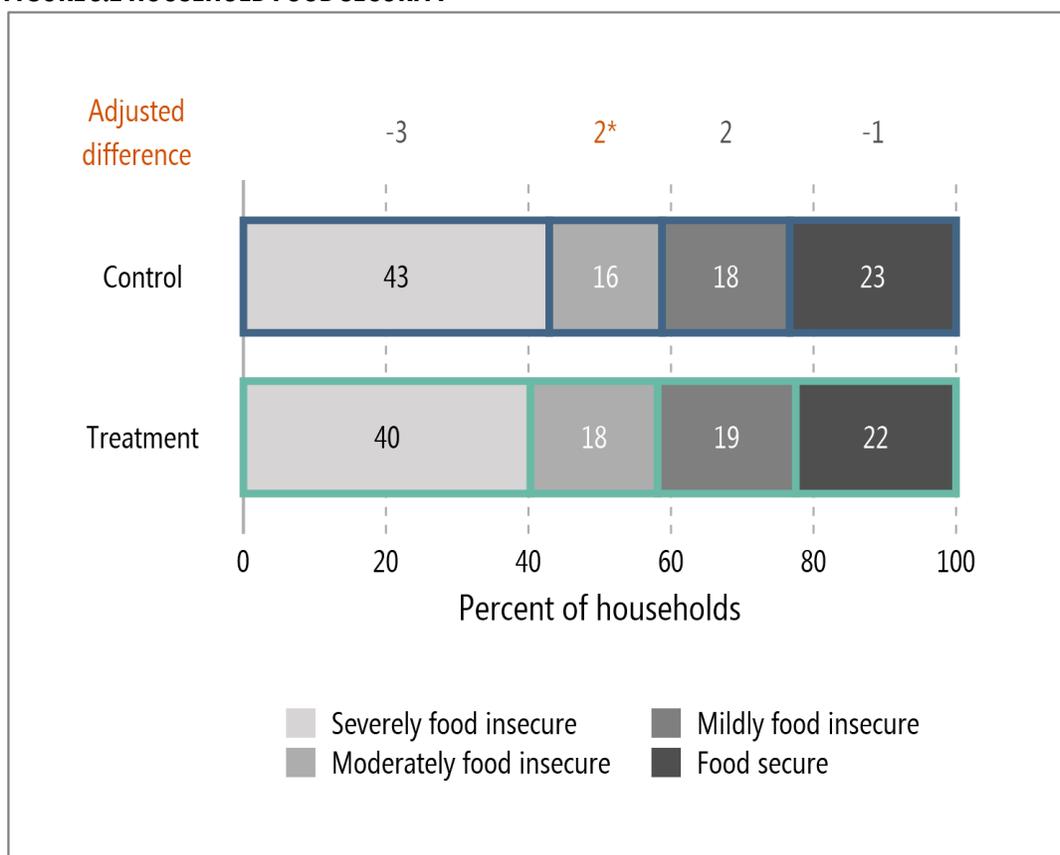
\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**About 6 in 10 households experienced some form of food insecurity in the past month, but food insecurity was very similar in the treatment and control groups.** Food security could affect children’s nutritional status because food insecure households might not be able to regularly provide children with the required nutrients for healthy growth. To assess household food security, we classified households on the Household Food Insecurity Access Scale (HFIAS), an internationally-validated scale that categorizes households as experiencing varying degrees of food insecurity (mild, moderate, or severe) based on how often (rarely, sometimes,

often) households practiced each of a set of nine behaviors over the past four weeks (Coates et al. 2007).<sup>27</sup>

In treatment areas, about 20 percent of households in the sample were classified as food secure based on the HFIAS. The remaining households were split about equally between the other less secure categories (mild, moderate, and severe). The percentage of households in each food security category was very similar across treatment and control areas.

**FIGURE 5.2 HOUSEHOLD FOOD SECURITY**



Source: Household baseline and endline surveys

Sample size: 9,120 households

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

## 5.2 Provider characteristics and health service access

In this section we examine the characteristics of the providers in the endline sample. We summarize selected provider characteristics in Figure 5.3, and provide a more complete set of

<sup>27</sup> The nine behaviors range from worrying about having enough to eat (indicative of mild food insecurity if the household reports this behavior sometimes or often), to eating smaller or fewer meals due to a lack of food (indicative of moderate food insecurity if the household reports this behavior rarely or sometimes, and severe insecurity if this behavior occurs often), to any member of the household going a whole day and night without eating due to lack of food (indicative of severe food insecurity, regardless of frequency).

characteristics in Appendix B Tables 5.3 and 5.4. We also describe health service access, focusing on access to posyandu and various types of facilities. We summarize availability in Figures 5.4 and 5.5, and provide a more complete description in Appendix B Tables 5.5–5.7.

### 5.3.1 Provider characteristics

**Kader posyandu, bidan, and puskesmas providers typically had several years of job experience; their characteristics were very similar in the treatment and control groups.** In treatment areas, kader posyandu were almost always female, and about two-thirds of them lived in the dusun where the posyandu was held; almost all others lived in another dusun but still in the same desa as the posyandu (Figure 5.3). (Where providers live could affect their ability to provide services because of transport constraints for providers who live far from where they provide services.) On average they were about 37 years old, almost half had completed senior secondary school or higher, and had 8 years of experience in the role.

Bidan in treatment areas were almost always female and lived in the desa that they served. On average, they had 10 years of experience in their position. About two-thirds had been in the position for five or more years, which means that at least two-thirds of bidan could have received the IYCF training supported by the Nutrition Project. About 6 in 10 were employed by the government as civil servants, and about 3 in 10 had a private practice in addition to their government work.<sup>28</sup>

Puskesmas providers in treatment areas—bidan coordinators, nutritionists, and sanitarians—had an average age of between 33 and 38 years and between 6 and 9 years of experience, depending on the type of provider. Although bidan coordinators were almost always female and employed as civil servants, a substantial minority of nutritionists and sanitarians were not (about one-fifth of nutritionists and one-third of sanitarians were male, and more than one-quarter of each were not civil servants). On average, just over 80 percent of bidan coordinators and nearly three-fourths of nutritionists and sanitarians lived in the same kecamatan as the puskesmas.

Across all the providers that we examined, the differences in characteristics between the treatment and control group are almost all small and statistically insignificant. This suggests that differences in provider characteristics are unlikely to be biasing estimated impacts on health-related outcomes in subsequent chapters.

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<sup>28</sup> All bidan, bidan coordinators, nutritionists, and sanitarians are required to have a post-secondary degree so we do not discuss education attainment for these groups.

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**FIGURE 5.3. CHARACTERISTICS OF PROVIDERS IN TREATMENT AREAS**

	 Kader posyandu	 Bidan	 Bidan coordinators	 Nutritionists	 Sanitarians
Average age	37	32	38	33	35
Female	99%	97%	97%	82%	64%
Employed as civil servant	n.a. (volunteer position)	58%	98%	71%	70%
Average years of experience in role	8	10	6	9	9
More than 5 years experience in role	44%	68%	38%	58%	58%
Residence	68% in dusun where posyandu held	99% in sampled desa	85% in same kecamatan as puskesmas	72% in same kecamatan as puskesmas	76% in same kecamatan as puskesmas

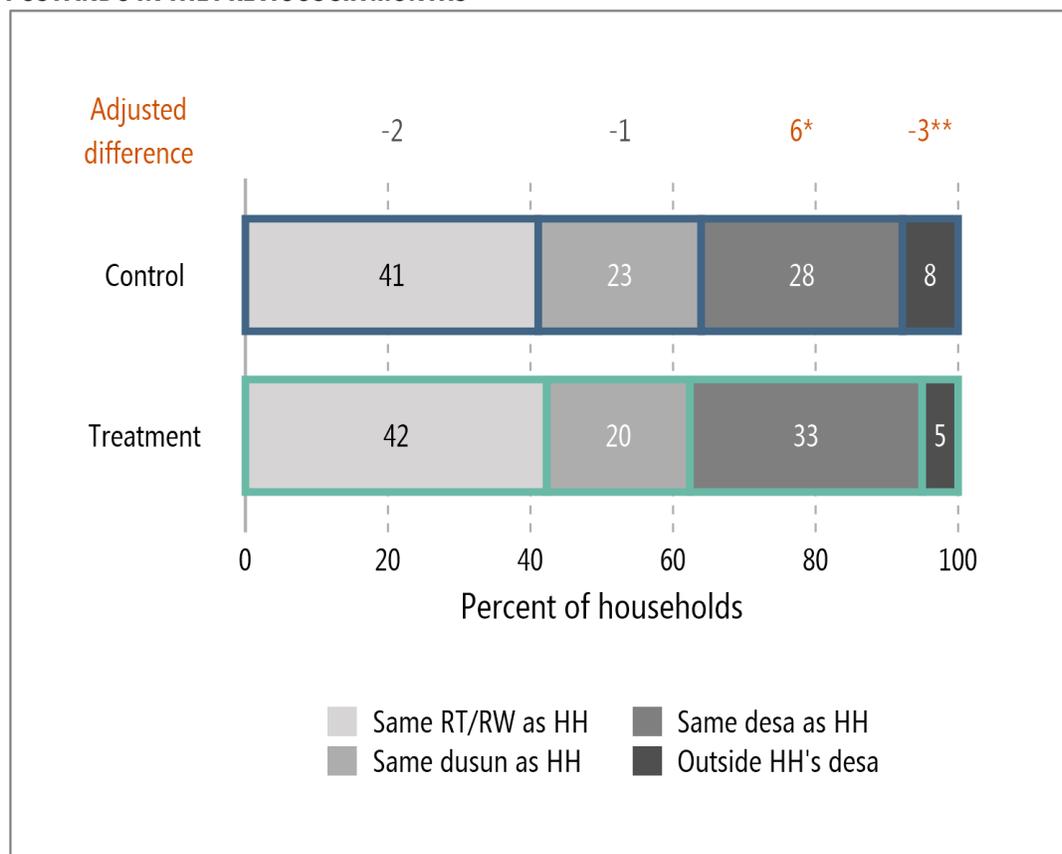
Source: Kader posyandu, bidan, bidan coordinator, nutritionist, and sanitarian endline surveys

Sample size: 979 kader posyandu, 391 bidan, 121 bidan coordinators, 121 nutritionists, 121 sanitarians

### 5.3.2 Access to health services

**Caregivers can typically access posyandu close to where they live.** In treatment areas, about 4 in 10 caregivers who had taken the sampled child to the posyandu in the previous six months accessed it in their own neighborhood (RT/RW), and 2 in 10 accessed it in their dusun but in a different neighborhood (Figure 5.4). Only about 1 in 10 accessed posyandu outside of their desa, which might require a more substantial travel distance and cost to access it. The location of posyandu relative to where caregivers live is very similar in the control group.

**FIGURE 5.4 POSYANDU LOCATION, AS REPORTED BY CAREGIVERS WHO BROUGHT THE SAMPLED CHILD TO POSYANDU IN THE PREVIOUS SIX MONTHS**



Source: Caregiver baseline and endline surveys

Note: HH stands for household

Sample size: 7,171 caregivers

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**Access to other health services was similar in the treatment and control areas; puskesmas, hospitals, and pharmacies were often located far from the desa.** About half of desa in treatment areas had a *poskesdes* (village health post) in the desa, and more than three-quarters had a *polindes* (village health post for labor and delivery) (Figure 5.5). On average across all treatment desa, these two facilities were about a 20 minute round trip from the kepala desa's office. Puskesmas and government hospitals, which are higher-level facilities that serve a broader geographic area, were located much further away—about a 1.5 hour and 5 hour round trip, respectively. The nearest pharmacy was about a 3 hour round trip from the desa, on average. These long travel times are associated with high travel costs, approximately Rp 532,254 (US\$38) to the hospital and Rp 164,790 (US\$12) to the pharmacy, which might be a barrier to access in addition to the time commitment required to travel to these facilities. Access to facilities (including their availability in the desa, travel time, and travel costs) were similar in the treatment and control groups.

We also analyzed average travel time between providers' residence and the location where they interact with clients. Average travel time to the posyandu reported by kader posyandu was

relatively low—ten minutes or less—which is not surprising because most lived in the desa they served. Average travel time to the puskesmas was between about 30 and 45 minutes for puskesmas-level staff. All of these travel time measures were similar in the treatment and control groups. Overall, these findings suggest that differences in household access to healthcare are unlikely to be driving impacts on outcomes in subsequent chapters.

**FIGURE 5.5. ACCESS TO HEALTH SERVICES IN TREATMENT AREAS**



Source: Kepala desa endline survey

Sample size: 1,167 kepala desa officials

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

## 6. PNPM-GENERASI

The *Program Nasional Pemberdayaan Masyarakat—Generasi Sehat dan Cerdas* (the National Community Empowerment Program: A Healthy and Smart Generation), also known as PNPM-Generasi or Generasi began in 2007. As part of the Nutrition Project, MCC contributed to funding Generasi in eight provinces in which implementation was already underway and provided funding in three new provinces that had not previously had Generasi; the latter were the provinces included in the impact evaluation.

Under the CDD model, Generasi provided facilitation and annual block grants (also known as *bantuan langsung masyarakat*, or BLM) to desa to be used for activities that could lead to improvements in child and maternal health and education in rural communities. As mentioned in Chapter 1, kecamatan allocated Generasi block grants to each desa based on the number of pregnant women and children in each desa, the difficulty of accessing education and maternal and child health services, and, after the first year, the progress made on 12 health and education indicators during the previous calendar year (PNPM PKK Central Coordination Team 2008).<sup>29</sup> Box 6.1 lists the 12 Generasi indicators. MCC and MCA-I largely supported the continuation of the previous iteration of Generasi, with some small modifications; specifically, MCC and MCA-I modified the Generasi training manuals to include a focus on stunting and worked with Generasi implementers to add the two indicators on nutritional group counseling session participation (indicators 9 and 10 in Box 6.1).

### BOX 6.1 GENERASI HEALTH AND EDUCATION INDICATORS

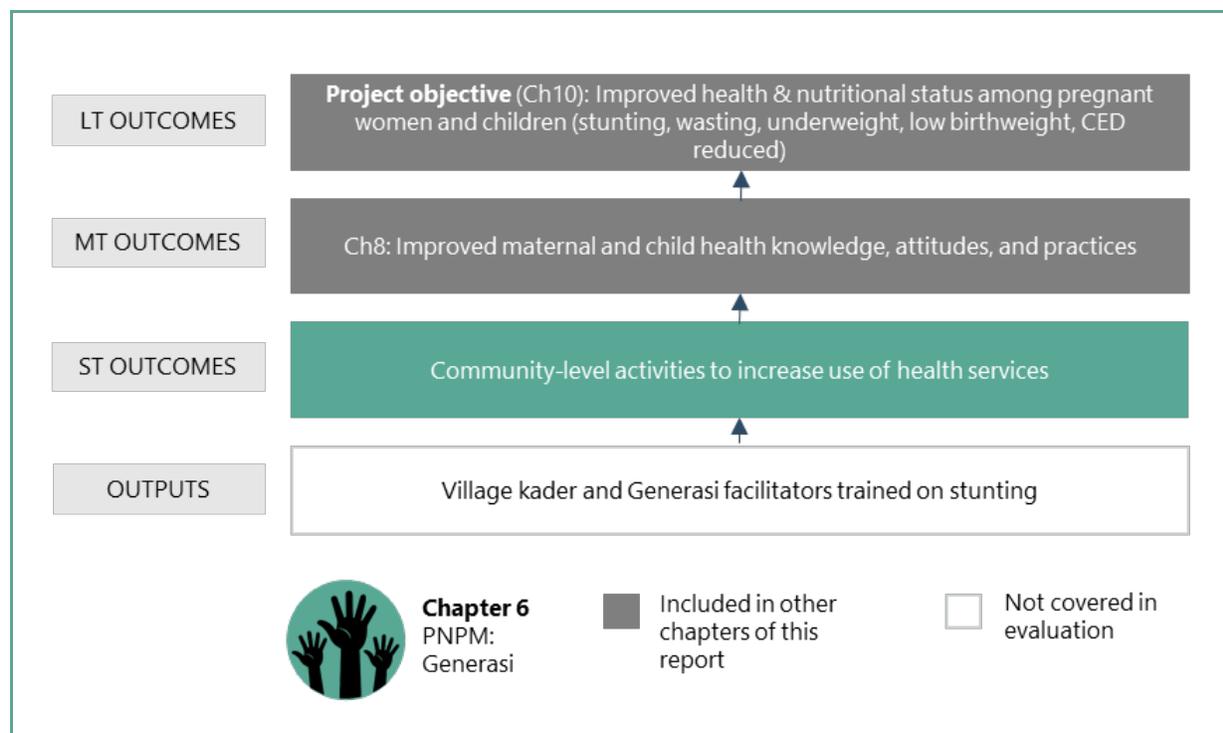
1. Four prenatal care visits
2. Taking at least 90 iron tablets during pregnancy
3. Delivery assisted by a trained professional
4. Three postnatal care visits
5. Complete childhood immunizations
6. Vitamin A twice a year for children under age 5
7. Monthly weighing for infants 0-5 months
8. Monthly weighing and weight increases for children under age 2
9. Participation of pregnant women and spouses in nutrition counseling offered through kelas ibu hamil
10. Participation of parents/caregivers of 0–2 year olds in nutrition counseling offered through kelas balita
11. All primary and junior secondary aged children that have not enrolled in school or have dropped out, including children with disabilities, enroll
12. All children that graduate from primary school, including children with disabilities, enroll in junior secondary school

As part of the Generasi planning process, communities set targets for each indicator and made decisions about how to spend block grant funds. Communities were to spend the funds on

<sup>29</sup> The evaluation is focused on child stunting and other maternal and child health outcomes, and did not measure education outputs or outcomes.

activities that would contribute to progress on the indicators they prioritized, for example by providing transport funds for pregnant women and bidan to attend prenatal appointments or deliver with trained health provider assistance. Communities could also spend funds on food assistance (called PMT) for poor families, families with children under age 5, or families with undernourished children. The “demand-side” Generasi intervention was expected to complement the “supply-side” interventions like trainings, contributing to improved maternal and child health outcomes, as shown in Figure 6.1.

**FIGURE 6.1 LOGIC MODEL WITH LINKS TO THE OUTCOMES IN THIS CHAPTER**



Notes: LT=Long-term; MT=Medium-term; ST=short-term

In this chapter we use the endline surveys, data on Generasi spending from the Ministry of Villages from 2012–17, and 2018 data from Bappenas on “stunting prevention activities” from the *Anggaran Pendapatan dan Belanja Desa* (APBDesa) or the desa-level revenue database, to describe Generasi implementation, including funding amounts and activities it supported. We also examine community awareness of and engagement with Generasi, and the sustainability of Generasi, measured by whether communities are supporting Generasi-relevant activities now that Generasi has ended. Finally, we analyze the impact of Generasi, specifically how health-related outcomes associated with Project indicators are different across treatment and control groups.



### KEY FINDINGS ON PNPM-GENERASI

- Nearly all desa had at some time utilized Generasi funds to support PMT, making it the most popular use of Generasi funds. Other popular activities were incentives for kader posyandu and contract bidan, health and nutritional counseling, and training for kader posyandu and bidan on IYCF and growth monitoring.
- Although it is a challenge to determine Generasi's sustainability with the available data, there are indications that Generasi desa are continuing the same health and sanitation activities in 2019 as they implemented in 2018 using a new government funding mechanism.
- The Project had impacts on 5 of the 10 health-related Generasi indicators, but these impacts were modest.

## 6.1 Generasi implementation

In this section we describe various aspects of Generasi implementation, specifically when Generasi was implemented, whether kecamatan complied with random assignment, how desa spent Generasi funds, and how communities engaged with and participated in Generasi. Detailed results are in Appendix B Tables 6.1–6.11.

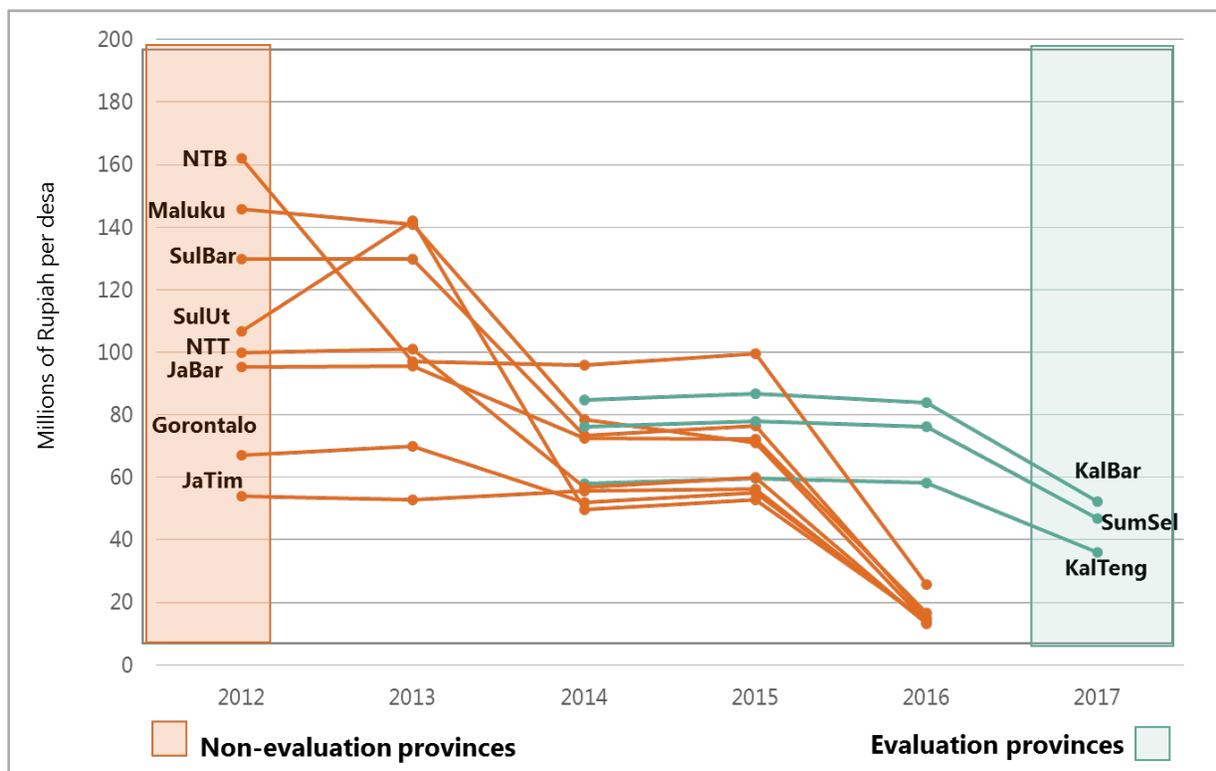
### 6.1.1 Implementation timing and funds receipt

As mentioned above, MCC provided financial support to Generasi in 11 provinces. In eight of these, Generasi was already operational before MCC began providing funding in 2014; MCC funded Generasi in these provinces until 2016, when Generasi ended. In the three evaluation provinces, which received Generasi for the first time in 2014, MCC supported Generasi from 2014 to mid-2017, when it was also phased out. The primary reason Generasi ended is that the Village Law, passed in 2013, sought to consolidate various desa-level CDD and other projects by directly providing desa with funds from the central government to support local projects. (This desa-level funding is known as *dana desa*, or DD). In practice this new funding mechanism means that desa have more discretion over how funds are spent than with Generasi, although desa are still required to spend a share of funds on health and education.

Figure 6.2 is calculated using the Ministry of Villages database (described in Chapter 3), which includes data on Generasi spending by desa and activity between 2012 and 2017 across all 11 provinces that MCC invested in. The figure shows the average block grant received per desa per year in each of these provinces, which comprise three evaluation provinces (green) and eight non-evaluation provinces (orange). In 2014, the first year in which Generasi was implemented in the three evaluation provinces, desa in these provinces received similar levels of funding as desa in the eight non-evaluation provinces where Generasi was ongoing. The funding in the

evaluation provinces remained stable between 2014 and 2016; the average block grant amount per desa in these years was Rp 74.4 million (about US\$5,300). In 2017, funding declined to between Rp 36 and 52 million (US\$2,600 and US\$3,800) per desa, depending on the province, as Generasi was phased out part way through the year. Total funding in evaluation provinces decreased about 40 percent, from over Rp 134 billion (US\$9.7 million) in 2014 to Rp 83 billion (US\$6 million) in 2017.

**FIGURE 6.2 AVERAGE DESA-LEVEL FUNDING FOR GENERASI IN EVALUATION AND NON-EVALUATION PROVINCES**



Source: Ministry of Villages Database (2012–17)

Note: The non-evaluation (orange) provinces included West Nusa Tenggara (NTB or Nusa Tenggara Barat), Maluku, West Sulawesi (SulBar or Sulawesi Barat), North Sulawesi (SulUt or Sulawesi Utara), East Nusa Tenggara (NTT or Nusa Tenggara Timur), West Java (JaBar or Java Barat), Gorontalo, and East Java (JaTim or Java Timur). The evaluation (green) provinces included West Kalimantan (KalBar or Kalimantan Barat), South Sumatra (SumSel or Sumatera Selatan), and Central Kalimantan (KalTeng or Kalimantan Tengah). Sample size: 5,890 desa

**Most kabupaten report that kecamatan and desa received their last tranche of BLM in 2017, but Generasi implementation continued through 2018.** The spending timeline shown in Figure 6.2 is consistent with reports from desa and kabupaten administrators surveyed at endline in early 2019. Fifteen of the 22 kabupaten included in the evaluation reported that the last BLM tranche arrived in 2017; the remaining kabupaten reported BLM funds arrived in 2018. However, nearly all kabupaten report receiving Generasi block grants that were not BLM in 2018, which meant that Generasi areas still received funds for their activities into 2018. (In the evaluation provinces, other funding, especially from DD, supported Generasi in 2018.)

**In most kabupaten, Generasi implementation started in 2014 and ended in 2018.** As discussed above, even though the last BLM was transferred in 2017, activities in the evaluation provinces occurred in 2018. In 18 out of 21 kabupaten,<sup>30</sup> kabupaten administrators reported that Generasi implementation started in their kabupaten in 2014; in the remainder administrators reported that it started in 2013 (one kabupaten) or 2015 (three kabupaten) (Figure 6.3). Nearly all kabupaten reported Generasi ending in 2018, except for two (which reported 2019). On average, Generasi was implemented for four-and-a-half years in kabupaten included in the evaluation.

**FIGURE 6.3 GENERASI IMPLEMENTATION TIMELINE, AS REPORTED BY KABUPATEN ADMINISTRATORS (NUMBER OF KABUPATEN)**



Source: Kepala desa endline survey  
Sample size: 21 desa administrators (data are missing for one kabupaten)

<sup>30</sup> While 22 kabupaten were included in the evaluation, data regarding Generai implementation timeline were only available for 21 kabupaten.

### 6.1.2 Compliance with random assignment

We examined compliance with random assignment by using desa administrators' reports about implementation.<sup>31</sup> According to these reports, compliance of Generasi implementation with the assigned treatment status was high. Ninety-seven percent of desa in treatment areas reported that they participated in Generasi compared to just two percent (15 desa) in control areas, and non-compliance was limited to South Sumatra (Table 6.1).

**TABLE 6.1 PARTICIPATION IN GENERASI, AS REPORTED BY KEPALA DESA**

	Sample size	Percent of desa in control kecamatan	Percent of desa in treatment kecamatan
Central Kalimantan	291	0	97.08
West Kalimantan	320	0	98.66
South Sumatra	171	7.17	93.80
Total	782	1.90	96.79

Source: Kepala desa administrator endline survey

Note: Results reported in percent unless otherwise indicated

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

### 6.1.3 Activities implemented under Generasi

In the interim report (Beatty et al. 2018), we used the Ministry of Villages database to determine how Generasi funds were spent. Our main findings were that (1) more than two-thirds of Generasi block-grant funds went to health-related activities (which is not surprising given that 10 of the 12 Generasi indicators are related to health outcomes); and (2) one-quarter of the Generasi funds allocated to health-related activities went toward funding PMT, which was the largest single category of spending. In this section, we build on those findings using endline survey data from desa administrators, as well as administrative data on desa-level spending, to further analyze the activities that were funded during and recently after Generasi.<sup>32</sup>

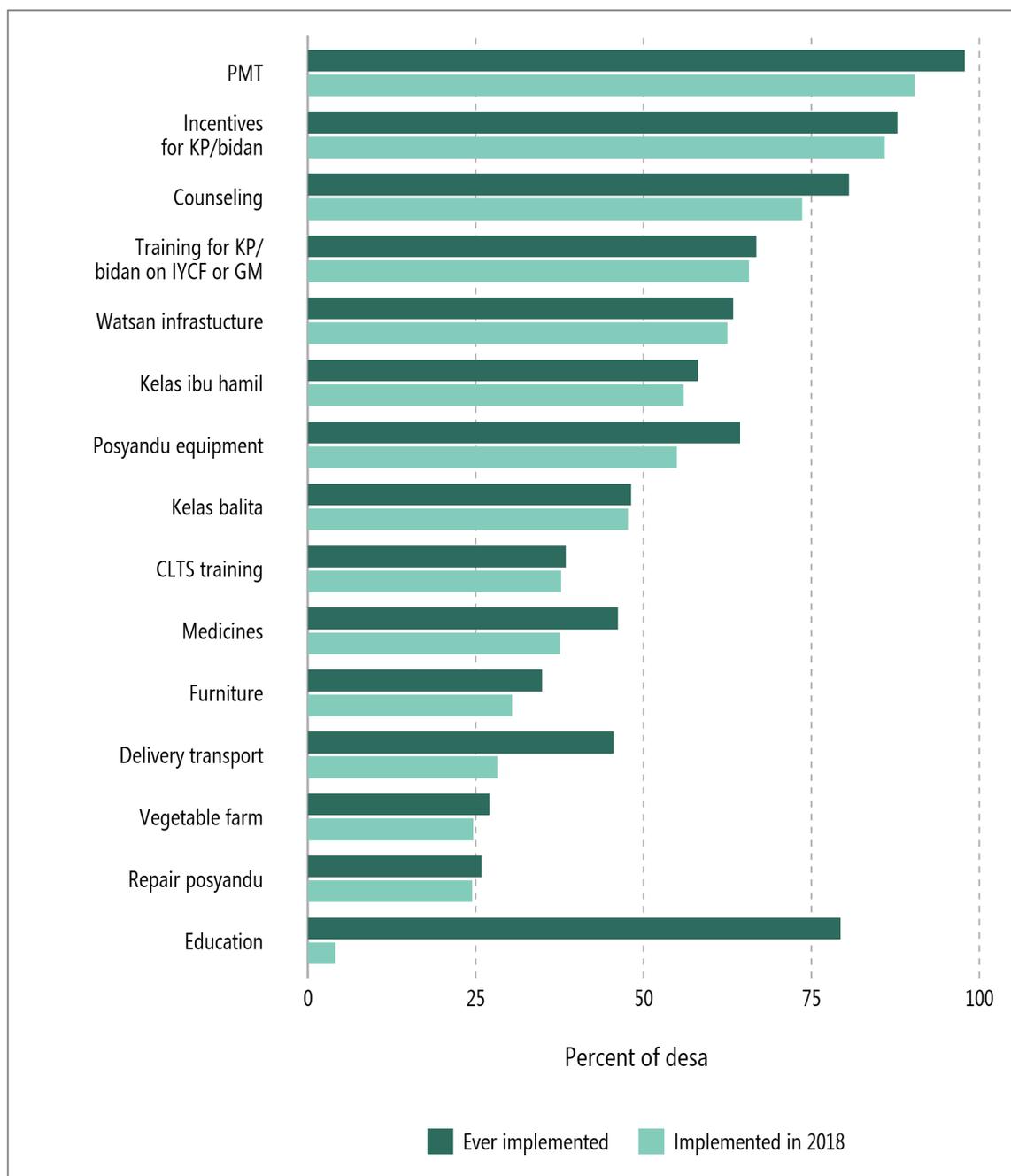
**PMT was the most common activity implemented under Generasi.** According to desa administrators' reports, Generasi supported PMT in nearly all desa (Figure 6.4). Other common activities were incentives for kader posyandu or contract bidan, likely for transport to reach patients; health and nutritional counseling for women, which also could include transport for pregnant women and children to get to health checkups; IYCF training for kader posyandu and bidan; equipment for the posyandu; infrastructure support for water and sanitation; and kelas ibu hamil or kelas balita.<sup>33</sup>

<sup>31</sup> As discussed in Chapter 3, MCA-I conducted random assignment at the kecamatan level. For this section, we use reports from kepala desa administrators about compliance rather than kecamatan administrators since desa administrators are the closest to implementation.

<sup>32</sup> We do not distinguish between desa in treatment and control kecamatan in this analysis; however, as we showed in Table 6.1, almost all desa where Generasi was implemented were in treatment kecamatan. Therefore, the results would be very similar if we restricted the sample to Generasi desa in treatment kecamatan.

<sup>33</sup> Contract bidan are not civil servants and are usually hired locally, by the kecamatan or desa.

**FIGURE 6.4 ACTIVITIES IMPLEMENTED UNDER GENERASI, AS REPORTED BY DESA ADMINISTRATORS**



Source: Kepala desa administrator endline survey

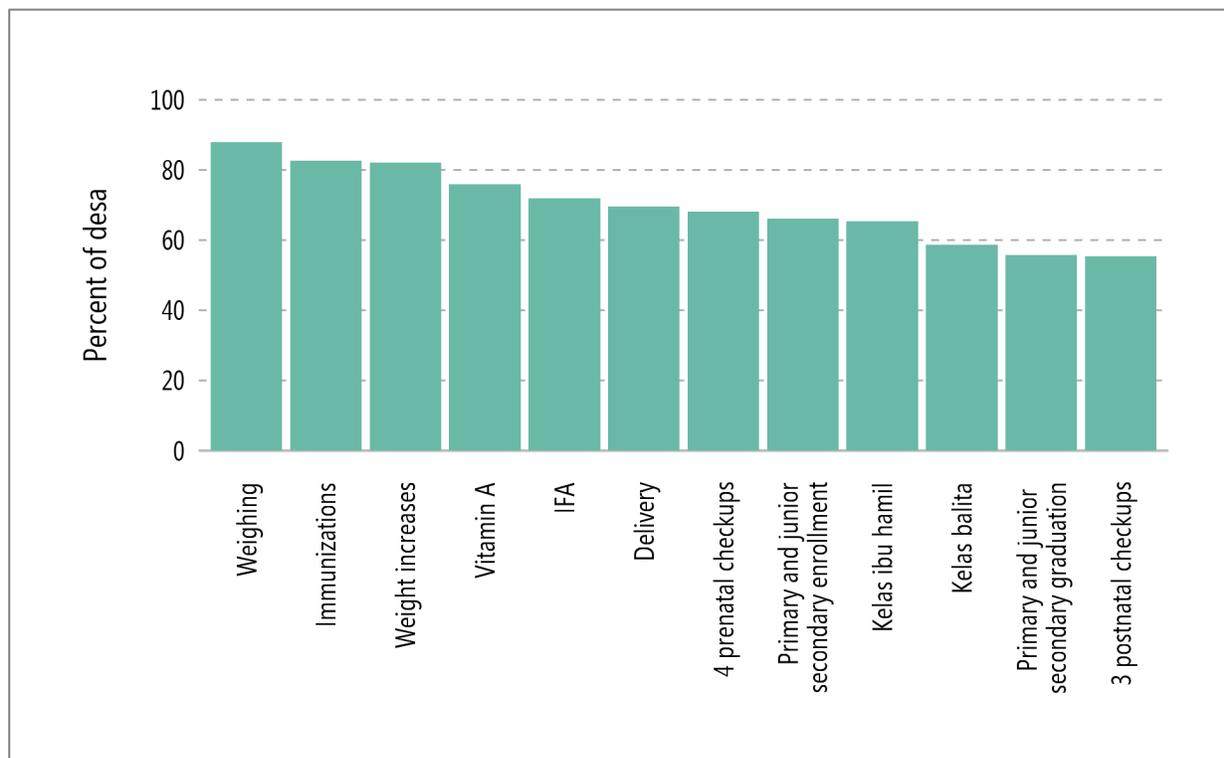
Note: Furniture = Furniture for health facilities. Counseling = Health and nutritional counseling. Watsan infrastructure = Infrastructure support for water or sanitation. Delivery transport = Transportation support for high-risk pregnancies or deliveries. A vegetable farm supports healthy food for the community.

Sample size: 384 desa administrators

**Desa most commonly focused on the indicators related to core functions of the posyandu.** According to desa administrators, out of the 12 Generasi indicators, desa most commonly chose

to focus on the Generasi indicators related to common posyandu functions: monthly weighing (88 percent of desa) and complete childhood immunizations (83 percent of desa) (Figure 6.5). (The posyandu is typically the main venue for child weighing and immunizations in these communities.) An exception to focusing on posyandu-related outcomes is the nutritional counseling sessions, which were less common and chosen by 61 or 66 percent of desa (depending on the type of session). Desa also less commonly focused on education and pre- and postnatal indicators.

**FIGURE 6.5 INDICATORS DESA FOCUSED ON IMPROVING, AS REPORTED BY DESA ADMINISTRATION ADMINISTRATORS**

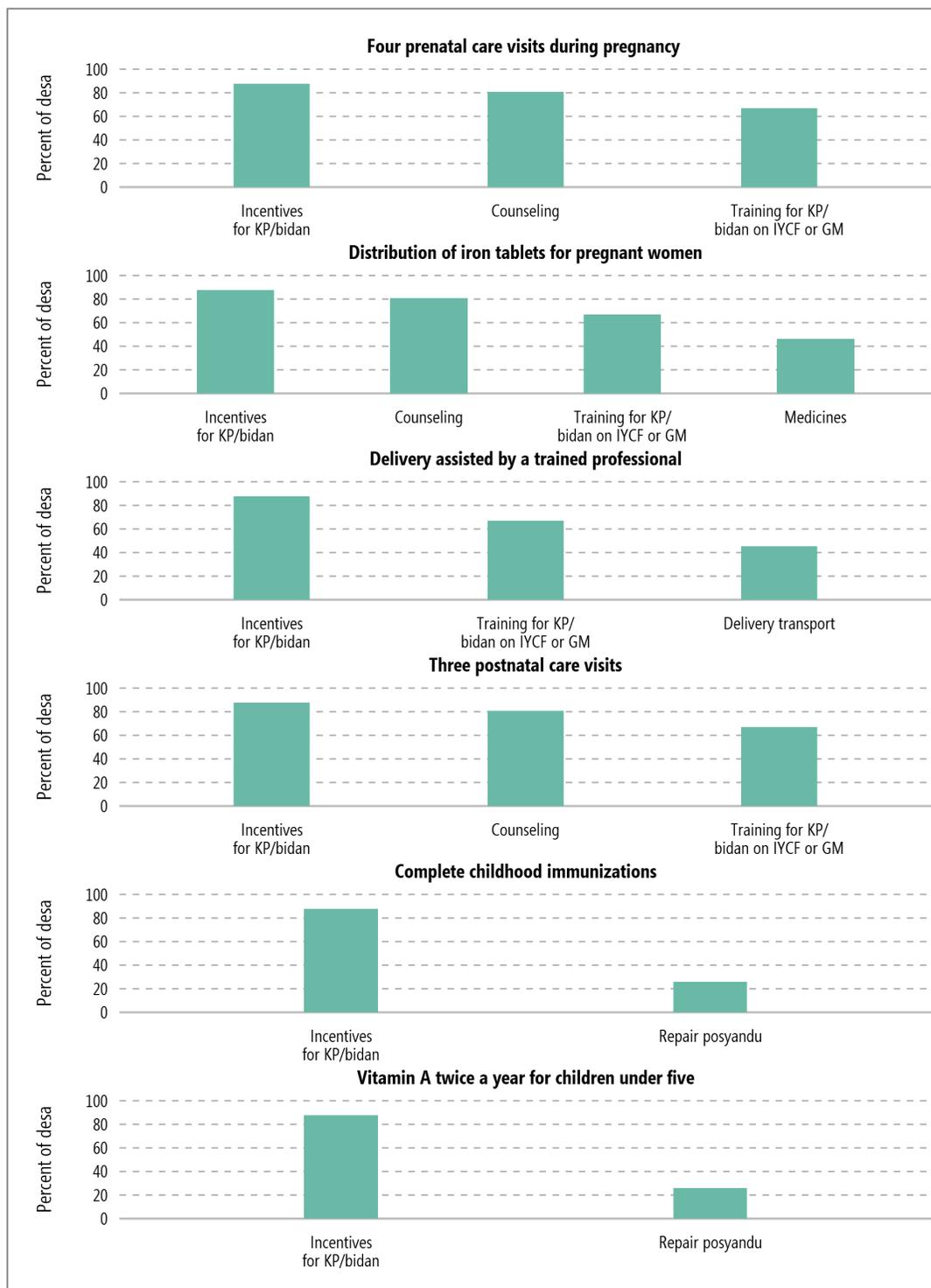


Source: Desa administrators endline survey

Sample size: 383 desa administrators

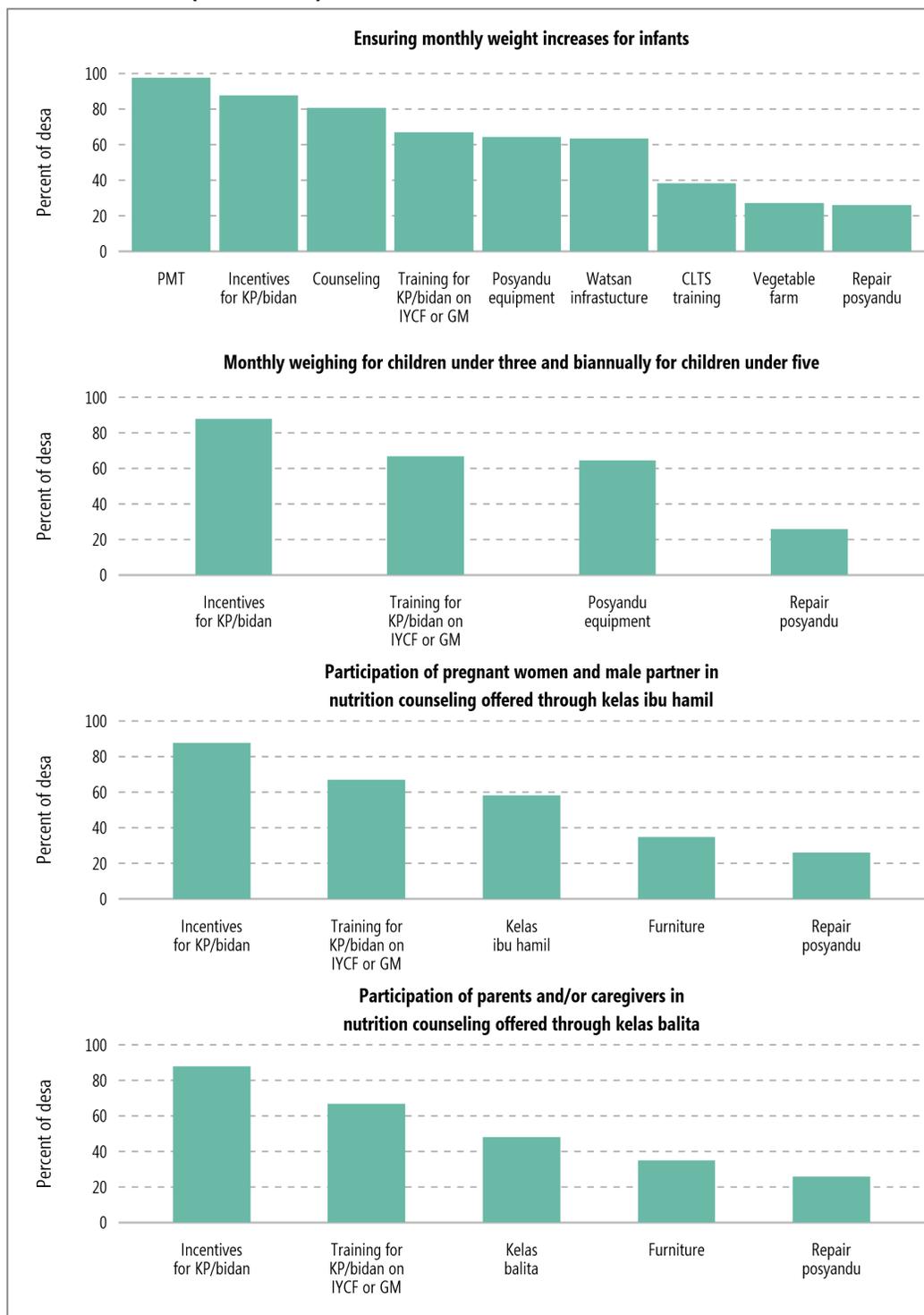
**There was high correspondence between the indicators desa focused on and activities related to those indicators.** We examined whether the activities communities implemented were consistent with the health-related indicators they said they prioritized, according to desa administrators. In Figure 6.6, we allocated activities to indicators, and then looked at the share of desa implementing the relevant activities if they said they had focused on a particular indicator. Incentives for kader posyandu and contract bidan was the most commonly implemented activity for nearly all indicators, with the exception of ensuring monthly weight increases for young children, for which nearly all desa chose to implement PMT.

**FIGURE 6.6 DESA IMPLEMENTING ACTIVITIES MAPPED TO GENERASI INDICATORS, AS REPORTED BY KEPALA DESA ADMINISTRATORS**



Source: Desa administrators endline survey.  
 Note: Furniture = furniture for health facilities.  
 Sample size: 373 desa administrators

**FIGURE 6.6 DESA IMPLEMENTING ACTIVITIES MAPPED TO GENERASI INDICATORS, AS REPORTED BY KEPALA DESA ADMINISTRATORS (CONTINUED)**

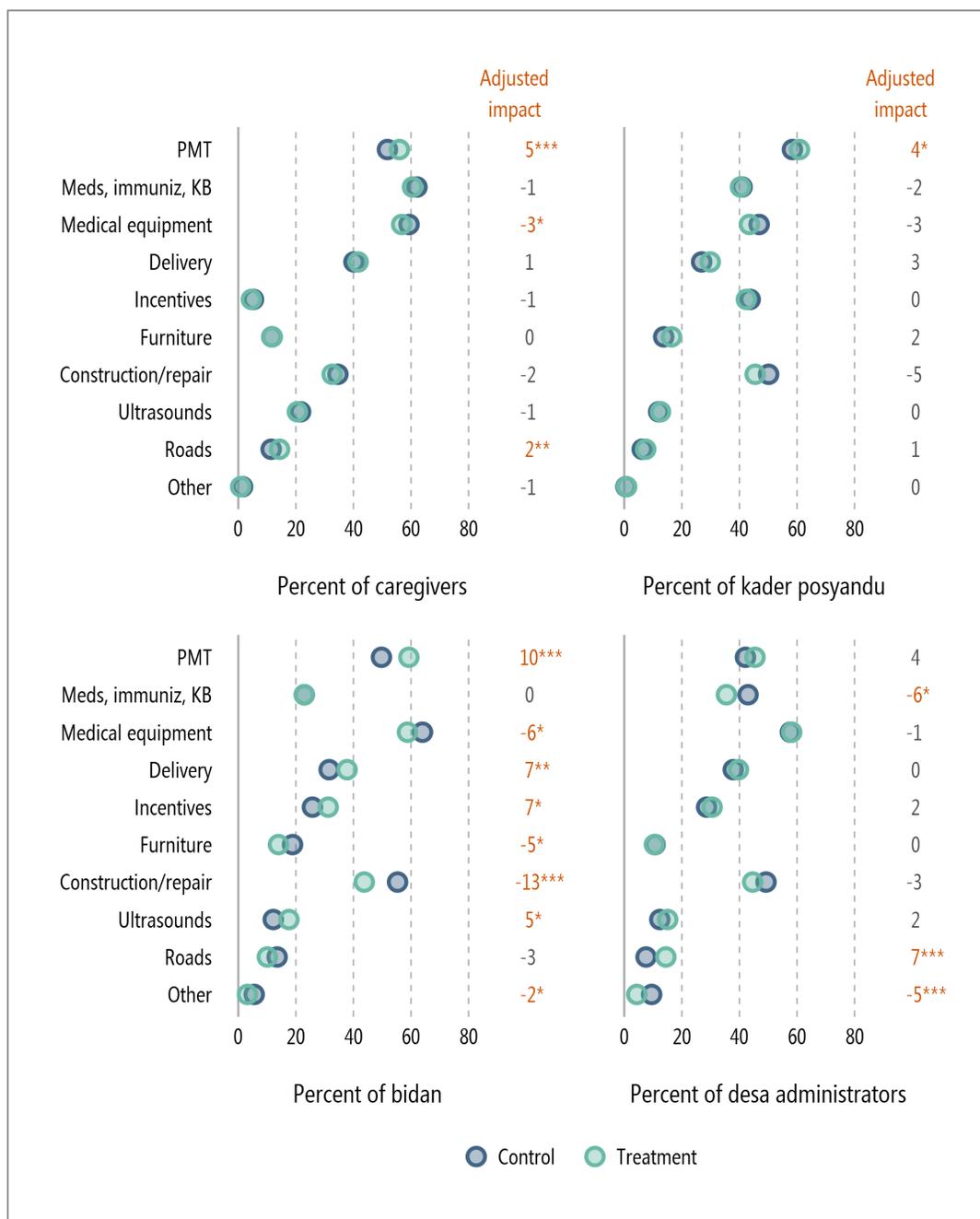


Source: Desa administrators endline survey.  
 Note: Furniture = furniture for health facilities.  
 Sample size: 373 desa administrators

**PMT, medical equipment, medicines, immunizations, and contraception were common priorities across community members; there were small differences in preferences across treatment and control groups.** We explored whether the common activities discussed earlier were also preferred by caregivers, kader posyandu, bidan, and desa administrators; and whether preferences differed across treatment and control groups, to see if Generasi had an effect on community preferences (Figure 6.7). Respondents were shown or read a list of nine common activities and asked what their top three preferred activities would be if their desa received a grant to support maternal and child health improvements.

PMT and medical equipment were common funding priorities across almost all respondent types, including caregivers, kader posyandu, bidan and desa administrators. For the other spending areas there was variation across respondents, but medicines, immunizations, and contraception, as well as construction or repair of polindes or posyandu buildings, were consistently among the top priorities. Differences in priorities between the treatment and control groups were generally small, although some were statistically significant. For example, caregivers, kader posyandu, and bidan in treatment groups preferred PMT over the control group. This preference was strongest among bidan, a very commonly preferred topic along with medical equipment. Desa administrators also highly favored PMT, but not as commonly as medical equipment, their first preference.

**FIGURE 6.7 CAREGIVER, PROVIDER, AND DESA ADMINISTRATION OFFICIAL PROJECT PREFERENCES**



Source: Household, kader posyandu, bidan, bidan coordinator, nutritionist, and desa administrators endline surveys

Note: Categories are abbreviated in the figure. These are the full category descriptions, if abbreviated: PMT = PMT for pregnant women, infants, and children under 5. Meds, immuniz, KB = Medicines, immunizations, contraceptives. (KB is the Indonesian abbreviation for family planning.) Delivery = Financial assistance for labor and delivery costs. Incentives = Incentives and honorariums for bidan desa or kader posyandu. Furniture = Furniture for the polindes or posyandu. Construction/repair = Construction or repair of polindes or posyandu buildings. Ultrasounds = Financial assistance for ultrasound examinations. Roads = Improved road access to polindes or posyandu.

Sample size: 9,120 households, 1,960 kader posyandu, 778 bidan, 1,165 desa administrators

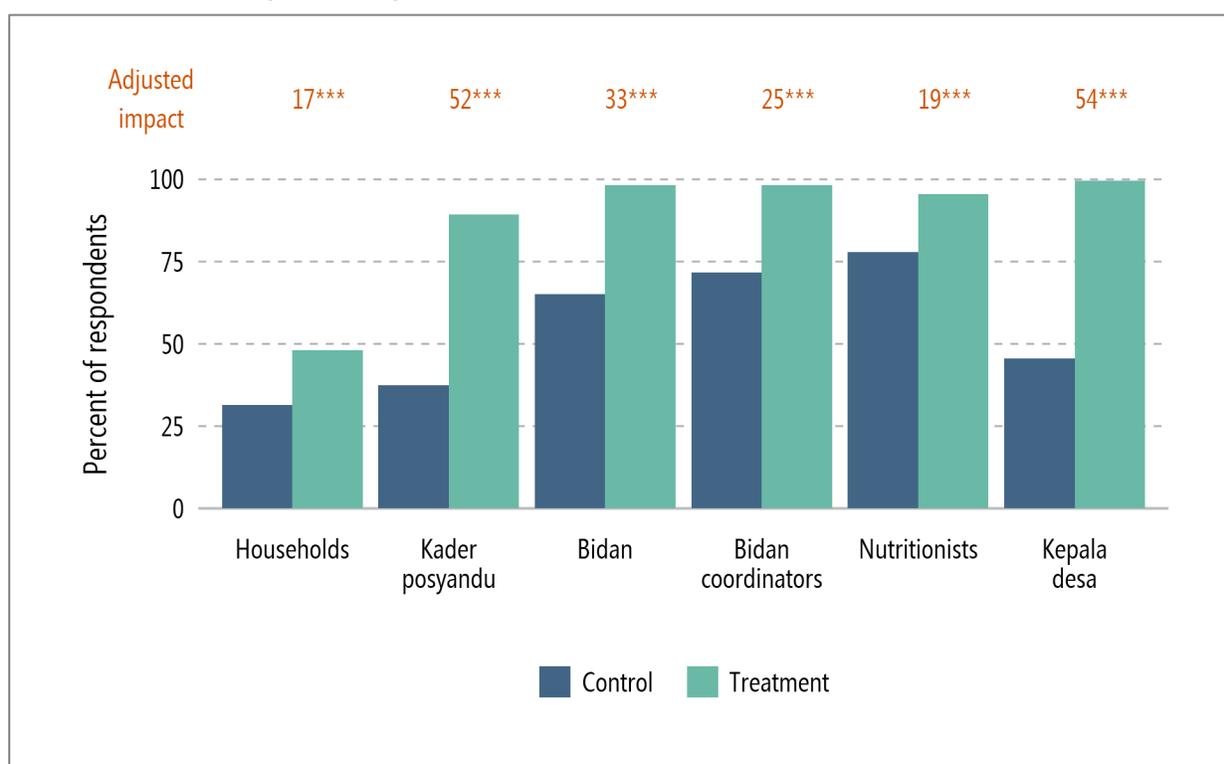
\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

### 6.1.4 Household and provider awareness of and participation in Generasi

The first step in generating participation in a CDD project like Generasi is for community members to be aware that the project is happening. In this section, we explore household, desa, and provider-level awareness of and participation in Generasi.

**About half of households and nearly all providers and desa administrators in treatment areas had heard of Generasi.** Forty-eight percent of household heads in treatment areas had heard of Generasi, a statistically significant 17 percentage points higher than in control areas (Figure 6.8). All desa administrators in treatment areas had heard of Generasi, a statistically significant 54 percentage points higher compared to control areas, which is not surprising since they played a key role in Generasi implementation. Consistent with Generasi’s health focus, awareness among health providers was also high. Specifically, 89 percent of kader posyandu and more than 95 percent of bidan, bidan coordinators, and nutritionists had heard of Generasi. The difference with the control areas was highest for kader posyandu, but was statistically significant for all providers.

**FIGURE 6.8 HOUSEHOLD, PROVIDER, AND DESA OFFICIAL AWARENESS OF GENERASI**



Source: Household, kader posyandu, bidan, bidan coordinator, nutritionist, and desa administrator endline surveys

Sample size: 9,120 households, 1,960 kader posyandu, 783 bidan, 242 bidan coordinators, 242 nutritionists, 784 desa administrators

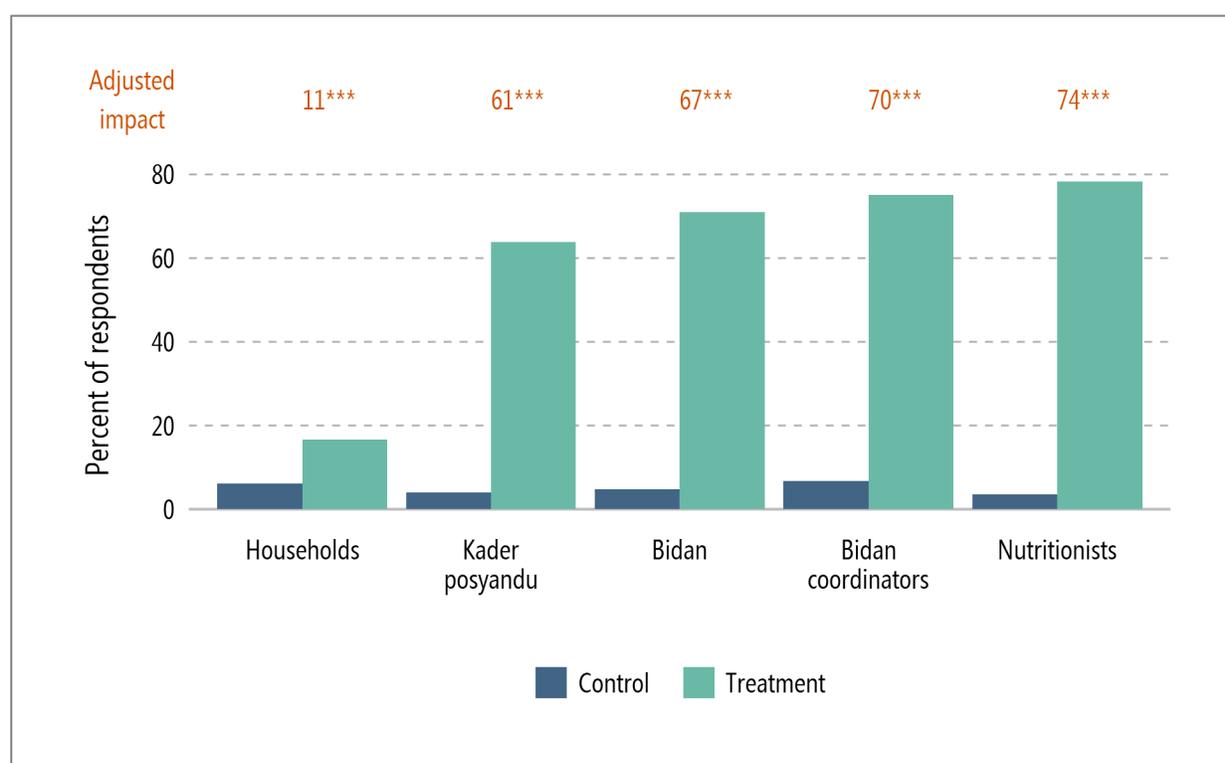
\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**Seventeen percent of households in the treatment group participated in Generasi.** We asked respondents who had heard of Generasi if they had ever participated in a Generasi meeting or activity. (In this context participation generally means being involved in the planning or

implementation of Generasi.) Only 17 percent of households had, a statistically significant 11 percentage points higher than in the control group (Figure 6.9). About 6 percent of households in the control group reported participating, which could be due to the fact that we had some non-compliance (15 desa), some spillover, for example across neighboring kecamatan, or respondents misunderstanding what Generasi is. The relatively low participation rates could be because households did not need to participate directly to benefit from Generasi spending in their communities.

Between 60 and 80 percent of kader posyandu, bidan, bidan coordinators, and nutritionists in the treatment group participated in Generasi, compared to less than 10 percent in control areas. Among providers in treatment areas who participated in Generasi meetings or activities, they participated on average between 5 and 7 times.

**FIGURE 6.9 HOUSEHOLD AND PROVIDER PARTICIPATION IN GENERASI**



Source: Household, kader posyandu, bidan, bidan coordinator, and nutritionist endline surveys

Sample size: 9,120 households, 1,960 kader posyandu, 783 bidan, 242 bidan coordinators, 242 nutritionists

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

## 6.2 Sustainability of Generasi

One goal of many CDD projects, including Generasi, is that communities utilize tools taught by the project to prioritize community needs and to implement activities that best meet those needs beyond the life of the project. Generasi's focus on areas with relatively poor maternal and child health outcomes meant that an additional measure of success for Generasi would have been communities' sustained support for maternal and child health efforts after Generasi had ended.

As mentioned earlier, Generasi funding was superseded by funding from DD. In comparing differences in spending under Generasi and DD, it is important to acknowledge that these mechanisms operate differently, which might partly drive changes in spending. Most kabupaten administrators interviewed did not think that one system was superior to another, but they noted some differences between them. Most importantly, the allocation of DD funds to activities largely depends on the preferences of the kepala desa, more so than with Generasi, under which trained facilitators help communities prioritize activities in a participatory manner. One official summarized the issue: “the DD system can be more advantageous compared to Generasi if the kepala desa is well oriented and the people want improvements. But, if kepala desa have different objectives, the DD system will be detrimental for the people.” Another noted that, “Under the DD system, the money is not directly given to the community.”

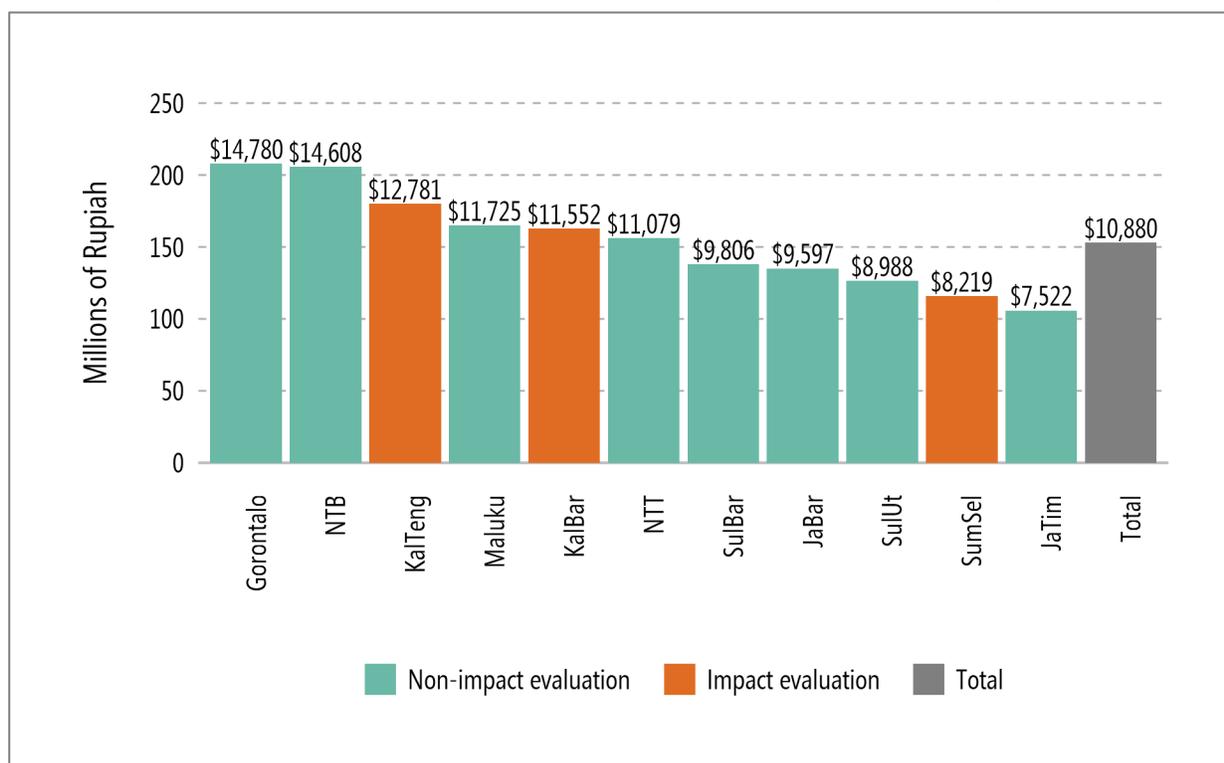
In this section, we look at how communities altered their spending as Generasi wound down in 2018 and after it ended in 2019. We look at changes in what communities are spending funds on and how much as an indication of sustainability, because maintaining “Generasi-like” activities would indicate support for the goals of the project. We utilize the APBDesa data discussed above on “stunting prevention” activities as this category was of interest to MCC and because this database had some overlapping categories with the Ministry of Villages data.<sup>34</sup> Detailed results are found in Appendix B Tables 6.12–6.18 and 6.28–6.30.

**In 2018, across the 11 Generasi provinces, desa spent about one-tenth of their budgets on “stunting prevention activities” alone.** In 2019, the average desa budget across evaluation provinces was about 1.4 trillion Rupiah (about US\$100,000). Desa spent an average of about 153 million Rupiah (about US\$11,000) from this budget just on “stunting prevention activities.” (Activity categories shown in Figure 6.11 below.) For most provinces, this amount was far larger than the average annual BLM from Generasi when Generasi was being fully implemented. This increase in funds illustrates the greater amount of money that desa have at their discretion with the Village Law; the funding allocated to the fairly narrow set of “stunting prevention” activities alone was greater than the entire amount of funding communities received under Generasi.

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<sup>34</sup> There were 19 spending categories in the APBDesa data and a approximately 100 in the Ministry of Villages data, and we were only able to identify 13 common categories. Comparing spending across the datasets is a challenge due to changing categories over time and large increases in DDs availability after 2017 due to the Village Law.

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**FIGURE 6.10 AVERAGE SPENDING BY DESA FOR STUNTING-PREVENTION ACTIVITIES IN 2018, BY PROVINCE**

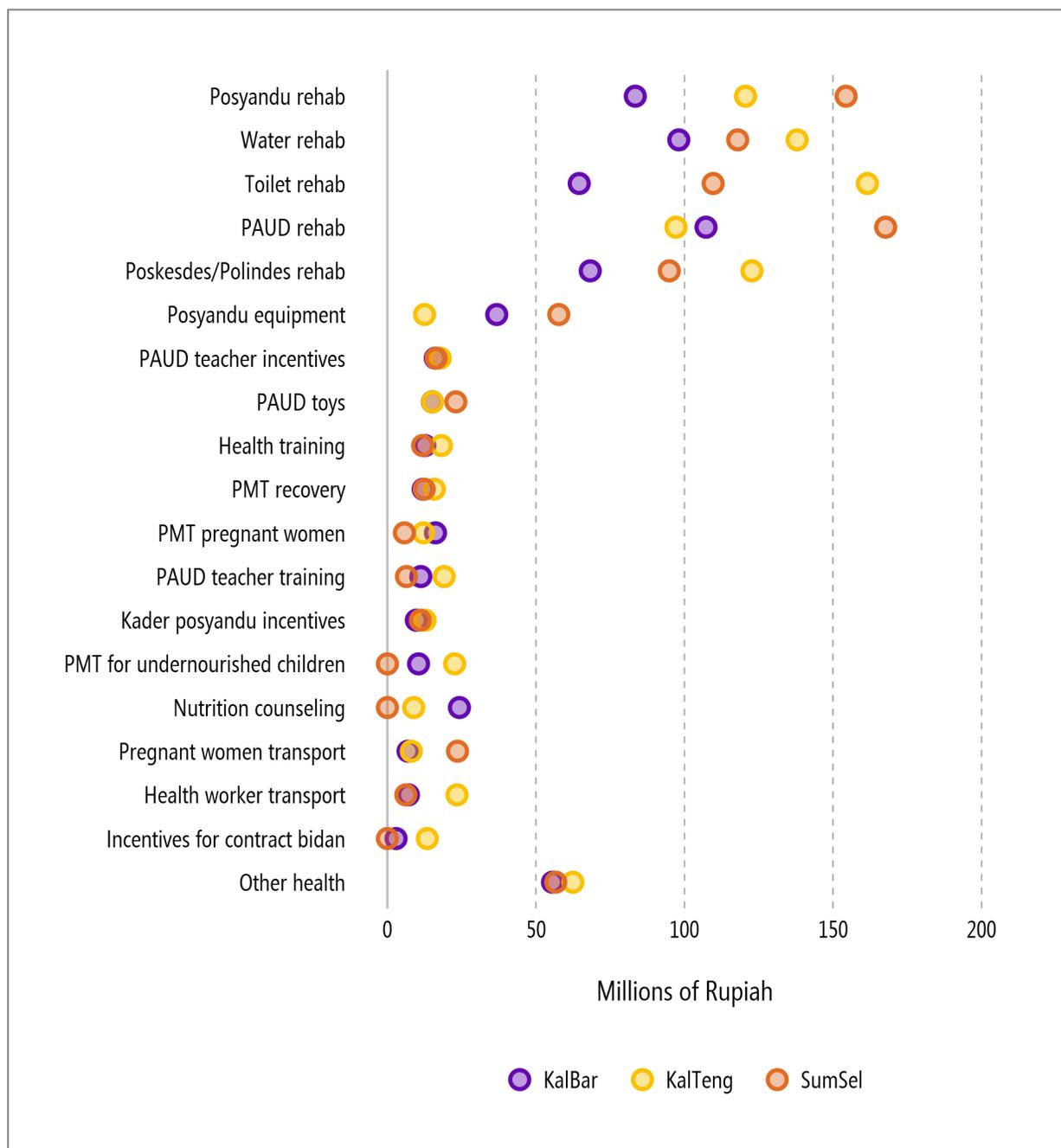
Source: APBDesa data 2018

Note: NTB = West Nusa Tenggara (*Nusa Tenggara Barat*); Kalteng = Central Kalimantan (*Kalimantan Tengah*); KalBar = West Kalimantan (*Kalimantan Barat*); NTT = East Nusa Tenggara (*Nusa Tenggara Timur*); SulBar = West Sulawesi (*Sulawesi Barat*); JaBar = West Java (*Java Barat*); SulUt = North Sulawesi (*Sulawesi Utara*); SumSel = South Sumatra (*Sumatera Selatan*); JaTim = East Java (*Java Timur*)

Sample size: 5,262 desa in 471 kecamatan

**Among stunting prevention activities, desa spent the highest share of funding rehabilitating infrastructure, such as water sources, PAUD (early childhood education) centers, posyandu, and public toilets.** Figure 6.11 shows the average spending by desa, province, and activity for 2018. We chose to focus on the three provinces included in the evaluation for visual clarity, and because these provinces are the main focus of this report. Rehabilitation spending accounts for the highest share of spending. Desa generally spent on average between Rp 70 million and 140 million (US\$5,000 and US\$10,000) on each type of infrastructure rehabilitation.

**FIGURE 6.11 AVERAGE SPENDING BY DESA, PROVINCE (THREE EVALUATION PROVINCES ONLY), AND ACTIVITY FOR STUNTING-PREVENTION ACTIVITIES FOR 2018**

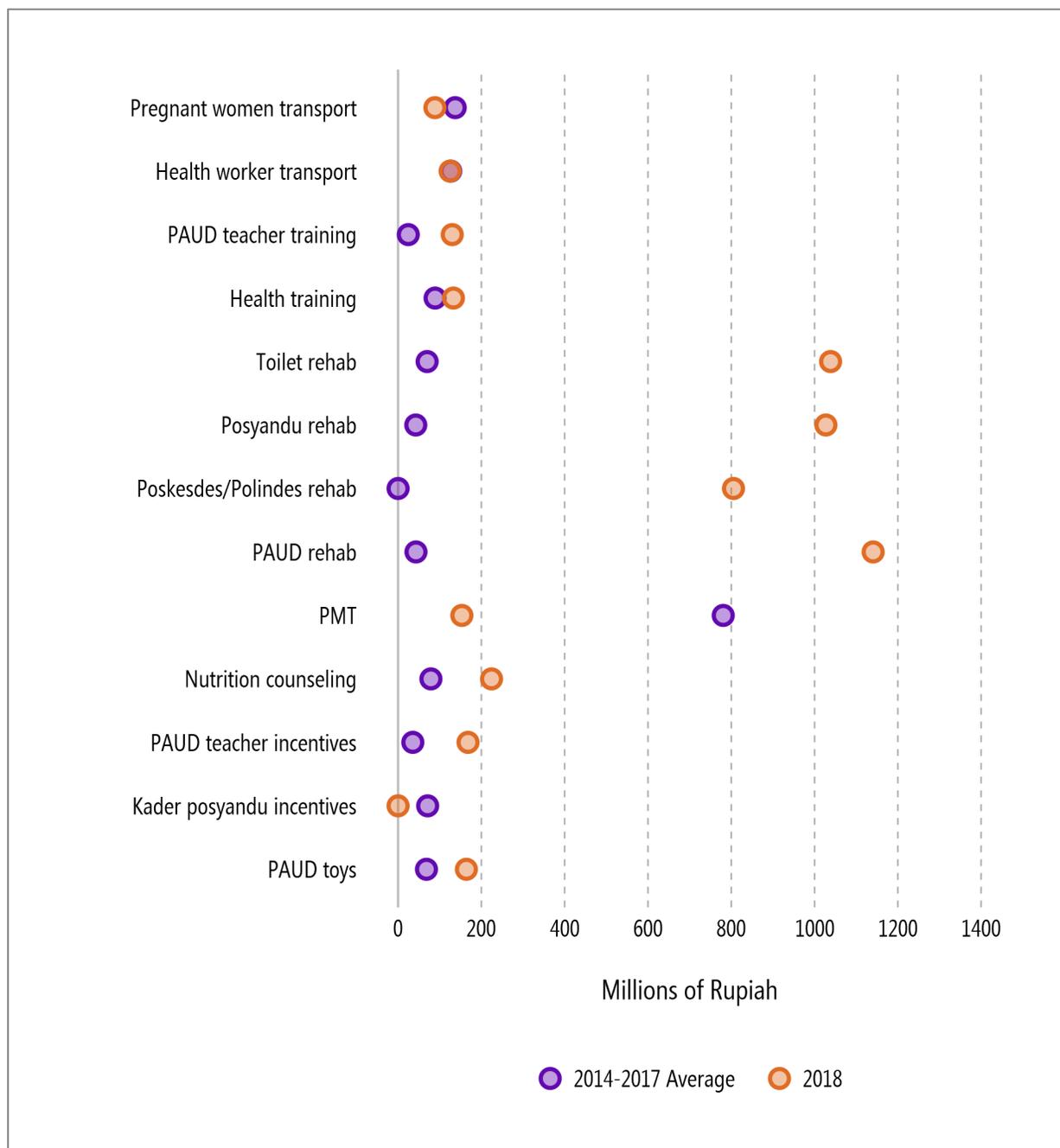


Source: APBDesa data 2018  
 Sample size: 1,942 desa in 132 kecamatan

Looking at how this spending has changed over time (Figure 6.12), 2018 spending is generally slightly higher for most categories compared to the 2014–17 average, with the exception of rehabilitation, consistent with the findings above. PMT, the highest spending category in 2014–

17 decreased in 2018, whereas most categories increased. PMT spending declined by 80 percent between 2014–17 and 2018.

**FIGURE 6.12 AVERAGE SPENDING BY DESA AND ACTIVITY FOR STUNTING-PREVENTION ACTIVITIES FROM 2014-18**

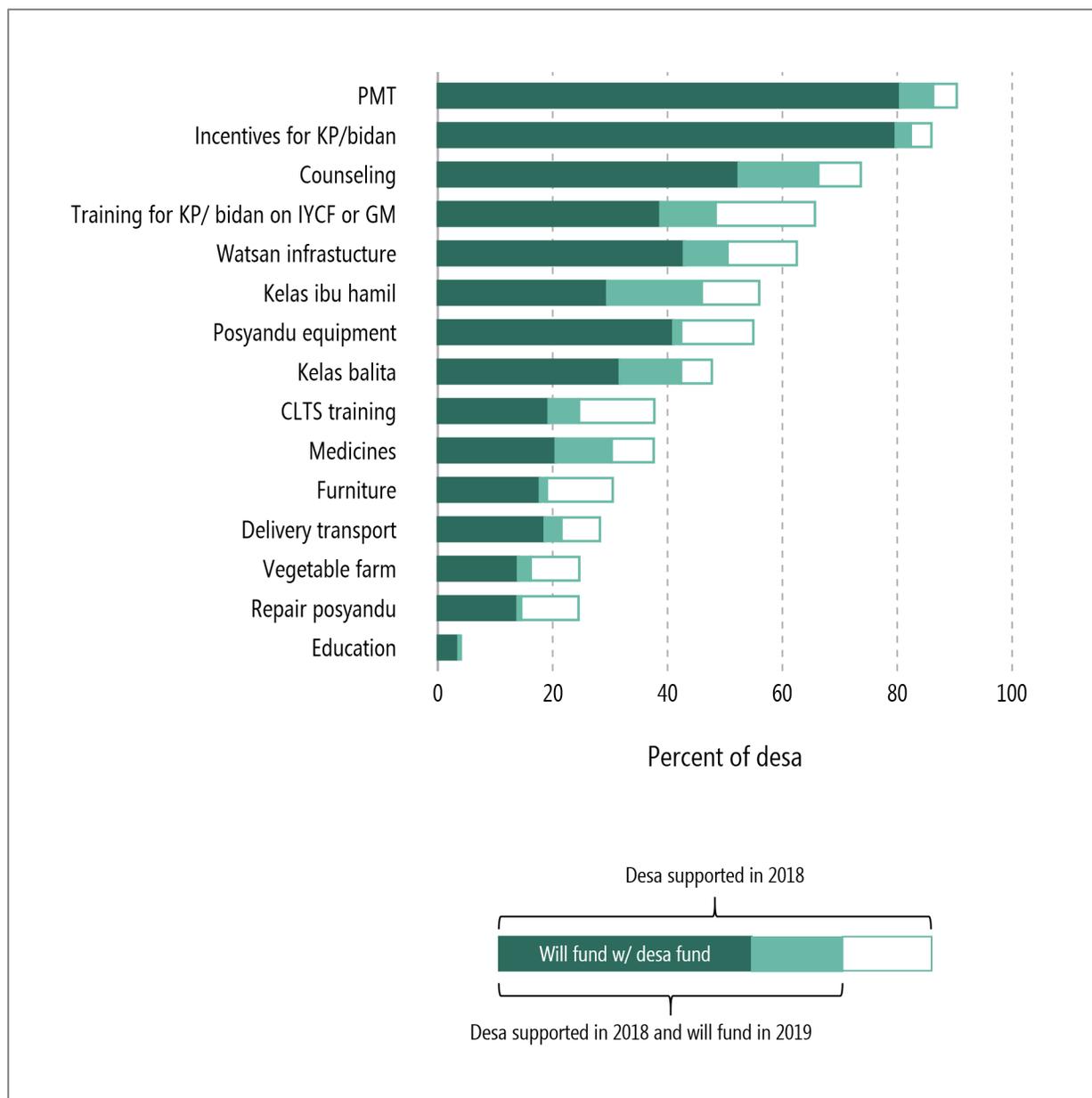


Source: APBDesa data 2018  
 Sample size: 6,204 desa in 511 kecamatan

**Generasi desa continued many of the same activities in 2018 and 2019, and used DD to support them.** Using the endline desa administrator survey data, we also looked at how desa-level spending on Generasi-related activities changed between 2018 and planned spending for 2019. Figure 6.13 shows that a high share of desa that implemented an activity in 2018 plan to implement it in 2019; and that DD is a primary source of funding for most activities. (We do not know if funding amounts changed for the activity; we only know whether the activity was implemented or not.) Thus, many Generasi desa-level activities are being sustained through the DD now that Generasi has ended.

One theme of the brief qualitative interviews with kabupaten representatives was that Generasi had resulted in an increased appreciation of the importance of community health on the part of desa administrators and households. For example, one kabupaten representative described how Generasi affected desa leadership: “One positive aspect learned from the existence of Generasi is that the kepala desa gets some insights to replicate Generasi activities into basic social service programs. The kepala desa that receive Generasi are more capable of including basic social services (health and education) in the DD-funded programs. They understand that the programs are beneficial to the community.” Other representatives noted that “The kepala desa has a new perspective on health and education programs,” and that “In Generasi areas, the kepala desa is aware of allocating DD for health sector activities.” This sentiment was also true of community members, according to the kabupaten representatives. For example “The health and education programs in the desa became more active and the community became more aware on the importance of maternal and child health.”

**FIGURE 6.13 GENERASI ACTIVITY SPENDING IN 2018 (FULL BAR, AMONG GENERASI DESA) AND 2019 (COLORED BARS, AMONG DESA WHO SPENT ON THAT ACTIVITY IN 2018)**



Source: Desa administrators endline survey

Note: Results reported in percent unless otherwise indicated

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

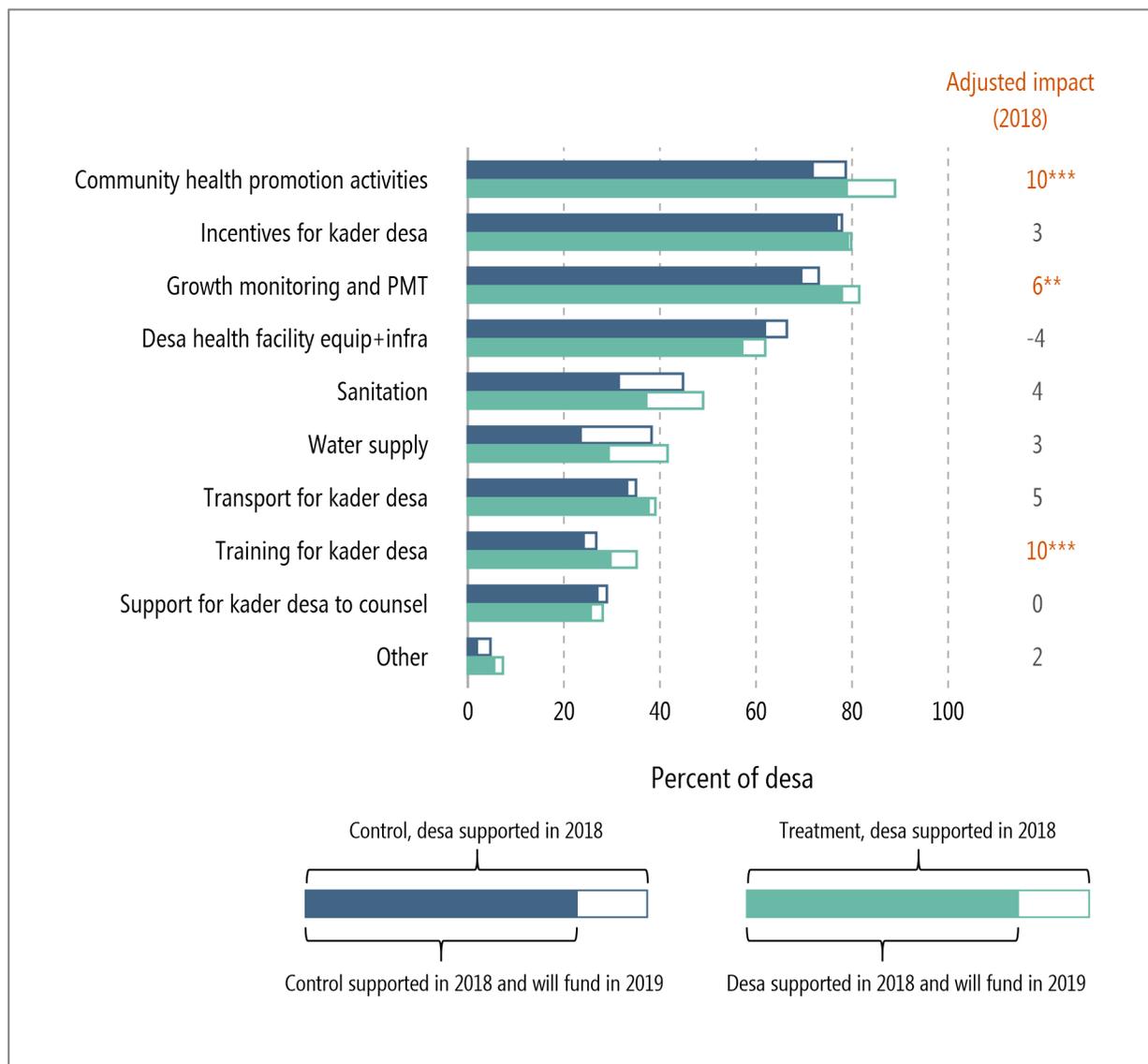
**Generasi desa were more likely to spend desa budget on community health promotion activities, growth monitoring and PMT, and training for kader desa in 2018 relative to control desa.**<sup>35</sup> We also examined sustainability by looking at how spending on sanitation and health categories from the desa budget (not just DD, but all spending) changed between 2018 and 2019, comparing treatment and control desa. Figure 6.14 shows that spending categories in treatment and control desa in 2018 were generally similar; there were a handful of statistically significant differences, but these were modest. Specifically, treatment desa were 10 percentage points more likely to spend desa budget on community health promotion activities, and training for kader compared to control desa; they were 6 percentage points more likely spend funds on growth monitoring and PMT. Desa tended to spend funds on the same activities from 2018 to 2019. Spending declined slightly for both treatment and control groups in 2019 and differences between treatment and control areas in 2019 were smaller than those in 2018, meaning spending tendencies in terms of activities became more similar over time.

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<sup>35</sup> Community health promotion activities include: implementation of Gerakan Masyarakat Hidup Sehat (GERMAS) or a healthy living campaign that promotes exercise, not smoking, not drinking alcohol, healthy eating, and not openly defecating; and campaigns to prevent STDs, HIV/AIDS, TB, hypertension, diabetes, and mental health problems.

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**FIGURE 6.14 DESA BUDGET SPENDING IN 2018 (FULL BAR, AMONG ALL DESA) AND 2019 (COLORED BAR, AMONG DESA WHO SPENT ON THAT ACTIVITY IN 2018)**



Source: Desa administrator endline survey

Sample size: 779-782 desa

Note: Results reported in percent unless otherwise indicated

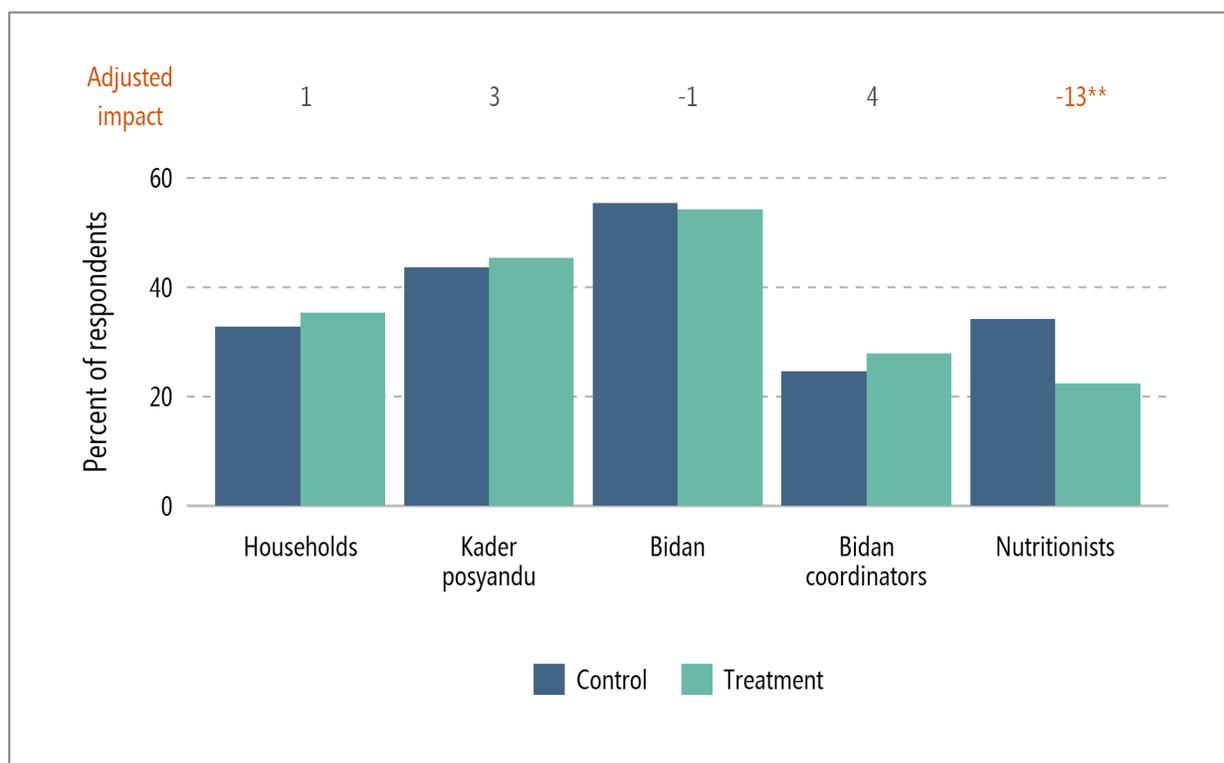
\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

We also examined whether kabupaten representatives thought activities implemented under Generasi would continue, using their qualitative responses in the endline survey. Most thought there was no change with the DD system. For example: “All Generasi activities were expected to be continued, especially for improving pregnant women and child nutrition, pre-school facility, incentive for pre-school teachers, provision of clean water, and transport allowance for kader. They were expected to be continued in order to reduce stunting in line with the desa commitment.” Similarly, “[t]he shift from Generasi to DD system is not detrimental. The

Generasi activities continue.” Many respondents cited in particular the continuation of posyandu, PMT, training for kader posyandu, or incentives for kader posyandu.

Others thought that the situation had worsened. “After Generasi was over, the desa lost significant chances to implement good programs needed by the community as not all Generasi programs related to health can be funded with DD.” This respondent foresaw a decline in posyandu participation. “Besides, the enthusiasm to participate in social activities related to Generasi have faded. For example, mothers often gather in posyandu for regular activities. But now that Generasi has ended, their participation declines.” Several mentioned that there is less support for kader posyandu. “Kader have fewer activities due to the short budget. There was a decline in kader capacity building activities.” Or “After Generasi has ended, training for kader was not regularly conducted as the village fund was only concerned with PMT and incentives for kader.” We do not see these differences (yet) in the quantitative survey data, but they may take longer to materialize.

**There was no sustained effect of Generasi on participation in community meetings that discussed how DD should be spent.** Another measure of sustainability for a CDD project is community engagement. We examined this question by assessing whether community members in treatment areas were more likely to attend desa-level meetings in 2018 that discussed how DD were to be spent. About one-third of households in treatment areas attended such meetings, and participation was similar to control areas (Figure 6.15). Participation in such meetings by providers in treatment areas ranged from less than a quarter (nutritionists) to just over one-half (bidan). (However, bidan who attended only reported attending two meetings on average in 2018, so bidan are not particularly active in desa planning activities.) There were no statistically significant differences in meeting participation between treatment and control groups among providers, except that nutritionists were 13 percentage points less likely to attend meetings in treatment areas.

**FIGURE 6.15 HOUSEHOLD AND PROVIDER PARTICIPATION IN COMMUNITY MEETINGS**

Source: Household, kader posyandu, bidan, bidan coordinator, nutritionist, and sanitarian endline surveys  
 Sample size: 9,087 households, 1,899 kader posyandu, 748 bidan, 237 bidan coordinators, 227 nutritionists  
 \* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

The fact that we see hardly any differences in participation across treatment and control groups could be because community engagement has waned now that Generasi is over. For example several kabupaten representatives noted that Generasi was more participatory: “During the Generasi meeting to plan the budget allocation, the community were actively involved. They looked enthusiastic in attending the meeting. However, after Generasi ended, there was less community involvement in the budget planning process.” And “the main difference was at the management level. DD is managed by the desa government and the implementers [community members], while Generasi was entirely managed by the community.” Because we did not examine similar participation measures over time, we also cannot rule out the fact that participation may have increased during Generasi and declined after it was over.

The biggest change between the DD system and Generasi was the facilitators, who were important for helping communities prioritize activities. Kabupaten representatives recognized that there are still kader desa to help with community mobilization and prioritization, but they are not as well trained or supported as they were with Generasi.

Praise and support of Generasi facilitators was echoed by nearly every respondent. For example, “The aspect that they wish still exists is the presence of facilitators. Generasi is a good program with good planning and competent facilitators. The program has sufficient activities focusing on

improving health. The facilitators were tremendously capable and helpful in planning programs at the desa level.” Similarly, “If there is no facilitator, we are afraid of having less competence to run the program due to limited skilled human resource in the desa. Their presence could support better and innovative health services. They could provide new ideas for the betterment of public services in the desa.”

### 6.3 Impacts on Generasi indicators

Because treatment kecamatan received a package of interventions along with Generasi, we cannot determine the impacts of the Generasi intervention alone. But we can look at the impact of the package of interventions on outcomes central to Generasi—the Generasi indicators. In this section we preview the results on the Generasi indicators that we discuss in greater depth in Chapter 8. We also consider community satisfaction with health and administrative services as another potential impact of Generasi. Detailed results are found in Appendix B Tables 6.19–6.20.

**The Project had positive impacts on 5 of the 10 health-related Generasi indicators, but these impacts were modest.** The Project had a statistically significant impact of 9 percentage points on receipt of 90 IFA pills during pregnancy. It also positively affected monthly weighing of children (for two separate age groups) and attendance at group counseling sessions (for two types of sessions). However, these impacts were modest (less than 10 percentage points) and unlikely to be sufficient to drive large changes in health outcomes. There were no impacts on the other indicators, including prenatal checkups, delivery with a skilled professional, postnatal checkups, complete immunizations, or receipt of vitamin A.

These findings are broadly consistent with the long-term impact evaluation of Generasi (Olken et al. 2018), which found small but statistically significant effects on the frequency of weight checks at the posyandu and ever attending a kelas ibu hamil and kelas balita, but no effects on other indicators. Specifically, we found significant impacts on the shares of 0–5 and 0–23 month olds who were weighed at least once a month since birth (5 and 8 percentage points, respectively). We also found very similar impacts to Olken et al. on mothers ever attending a kelas ibu hamil and on caregivers ever attending a kelas balita (8 and 7 percentage points, respectively). However, Olken et al. found no impact on receipt of at least 90 IFA pills during pregnancy, in contrast to the positive impact that we estimated.

**TABLE 6.2 GENERASI INDICATORS**

Indicator #	Generasi indicators (percentage)	Baseline			Endline			
		Sample size	Control mean	Treatment mean	Sample size	Control mean	Treatment mean	Adjusted impact
1.	Four prenatal checkups	669	80.4	81.4	2,153	80.0	79.9	-0.5
2.	Received 90 iron pills during pregnancy	1,026	14.7	12.7	3,027	14.2	22.8	8.7***
3.	Delivery by trained professional	2,996	76.8	73.8	9,017	84.1	84.1	0.1
4.	Mother received three postnatal checkups	n.a.	n.a.	n.a.	2,802	17.8	18.0	0.1

Indicator #	Generasi indicators (percentage)	Baseline			Endline			
		Sample size	Control mean	Treatment mean	Sample size	Control mean	Treatment mean	Adjusted impact
4.	Baby received three postnatal checkups	592	16.4	13.2	1,406	19.8	22.8	3.3
5.	Complete childhood immunizations	1,896	59.8	57.8	6,000	64.0	67.1	2.3
6.	Vitamin A twice / year, among 12–35 month olds	1,925	22.7	23.3	6,018	22.6	25.1	1.9
6.	Vitamin A twice / year, among 6–35 month olds	2,440	26.7	29.3	7,538	30.6	33.5	2.3
7.	0–5 month olds weighed monthly	514	68.3	73.7	1,490	75.1	82.1	5.4*
8.	0–23 month olds weighed monthly	2,066	47.8	53.7	4,599	47.5	56.9	8.2***
9.	Pregnant woman ever attend kelas ibu hamil	2,997	11.5	12.0	3,040	20.8	29.4	8.4***
9.	Husband ever attend kelas ibu hamil	386	14.6	13.6	920	14.4	13.2	-1.5
10.	Caregiver attend kelas balita	3,034	6.2	8.0	9,115	9.7	16.0	6.6***
10.	Husband ever attend kelas balita	227	8.5	14.0	1,419	13.6	12.2	-1.8

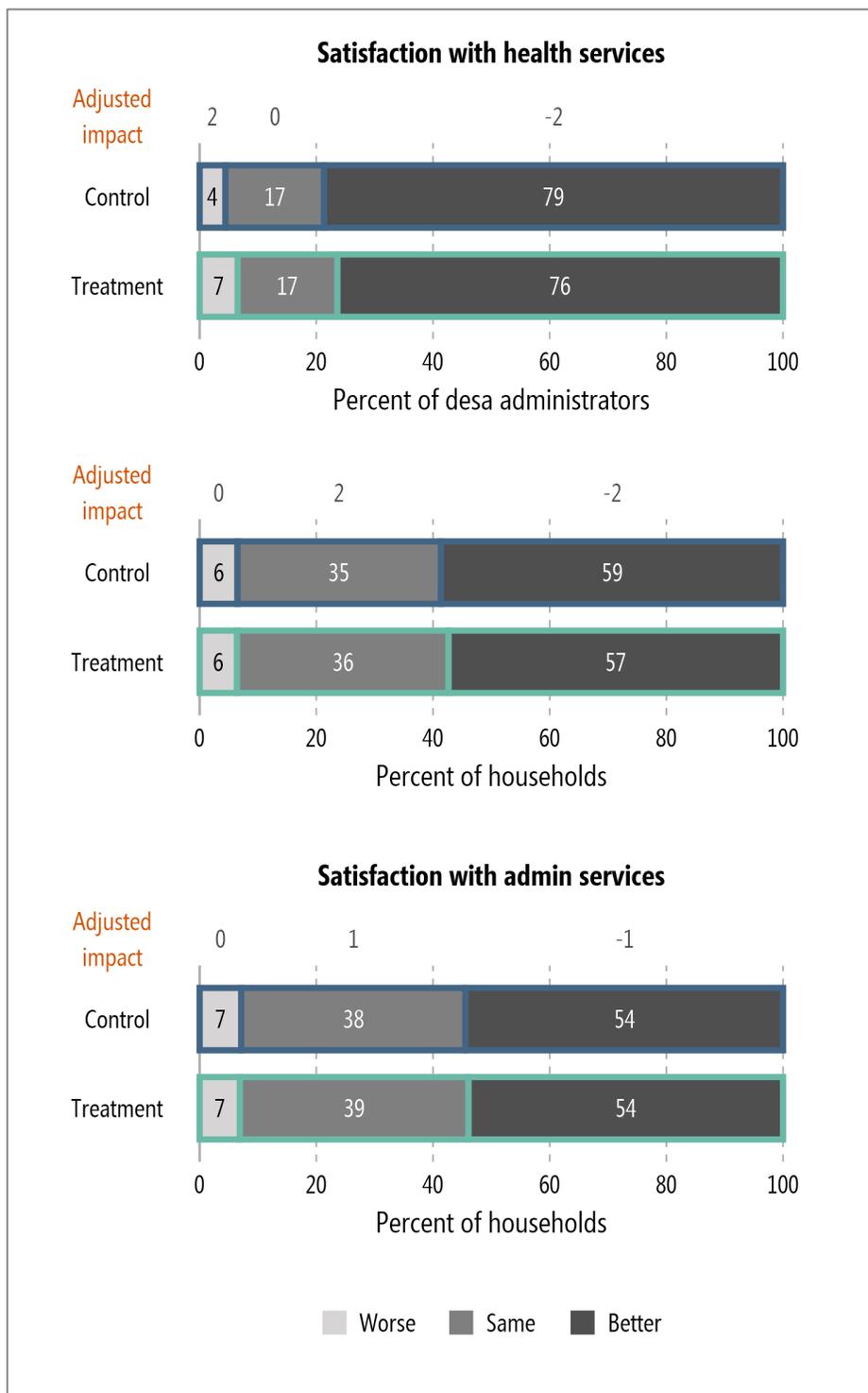
Source: Caregiver endline survey

Notes: The indicators for postnatal visits, monthly weighing, Vitamin A receipt, and kelas ibu hamil and kelas balita attendance differ from the Generasi KPI indicators due to data limitations. The indicator for monthly weighing measures weighing monthly since birth whereas the KPI indicator measures weighing over the last three months. The indicators for kelas ibu hamil and kelas balita attendance (for both caregiver and husband) measures whether the respondent has ever attended whereas the KPI indicator measures monthly attendance. Indicator definitions are in Appendix B.

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**Just over half of households felt that health and administrative services improved over the last two years.** Because CDD projects aim to improve service delivery and community satisfaction with services, we also asked households whether the health and desa administrative services in their desa were worse, the same, or better than two years ago. Just over half said they were better, and only a small share said they were worse (Figure 6.17). There was no statistically significant difference in treatment and control groups in this measure, indicating that the Project did not have an effect on satisfaction. We also asked desa administrators about their satisfaction with health services, and nearly 80 percent felt they were better than two years ago, indicating a high level of satisfaction with service improvement (which desa administrators were possibly responsible for). There was also no statistically significant difference across treatment and control groups in this satisfaction level.

**FIGURE 6.16 HOUSEHOLD AND DESA ADMINISTRATORS' SATISFACTION WITH HEALTH AND ADMINISTRATIVE SERVICES**

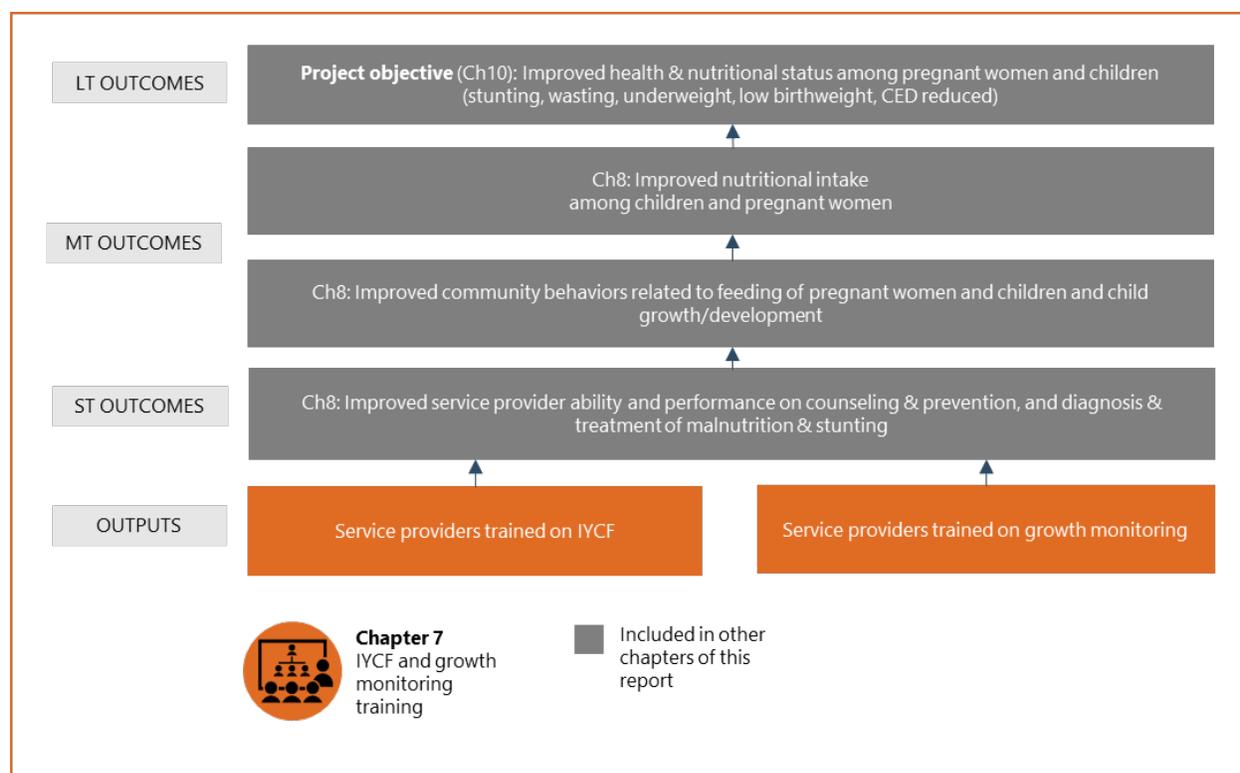


Source: Household and kepala desa administrator endline surveys  
 Sample size: 8,688–8,806 households and 784 kepala desa administrators  
 \* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

## 7. IYCF AND GROWTH MONITORING TRAINING

Two core components of the Nutrition Project were nutrition-focused trainings for service providers that included (1) a comprehensive training on IYCF topics and (2) a training on how to measure and monitor the growth of infants and young children (growth monitoring training). The IYCF training, which targeted providers at the puskesmas and desa levels, sought to improve providers' knowledge about various aspects of IYCF, with a focus on breastfeeding and complementary feeding. It also included other aspects of maternal and child health, such as a healthy diet during pregnancy, how to handle complicated deliveries, IFA promotion, and proper handwashing techniques. In addition to imparting knowledge, the training also sought to improve providers' ability to effectively communicate the knowledge to their clients. The growth monitoring training, which targeted puskesmas-level providers (bidan coordinators and nutritionists), sought to improve providers' abilities to accurately measure child weight and length/height, interpret the results to identify undernourished children, and provide follow-up counseling to these children's caregivers. Figure 7.1 shows how both types of trainings were key Project outputs that were expected to underpin medium-term behavior change at the community level related to child feeding and undernutrition prevention.

**FIGURE 7.1 LOGIC MODEL WITH LINKS TO OUTCOMES IN THIS CHAPTER**





### KEY FINDINGS ON IYCF AND GROWTH MONITORING TRAINING

- The Project substantially increased the share of providers trained in IYCF in treatment areas relative to control areas.
- The Project had a positive but less of an impact on the share of providers trained in growth monitoring.
- Both types of training were slightly longer, covered a wider range of topics, and used more interactive teaching methods in treatment areas compared to control areas.
- Impacts on provider and caregiver knowledge related to breastfeeding, growth measurement, and stunting were modest, at best.

In this chapter we present findings related to IYCF and growth monitoring training, in turn. We assess the extent and timing of participation by providers and describe the characteristics of the trainings. We also examine the extent to which the trainings affected knowledge of key topics covered. In Chapter 8 we assess impacts on the medium-term caregiver behaviors that the trainings were ultimately intended to affect.

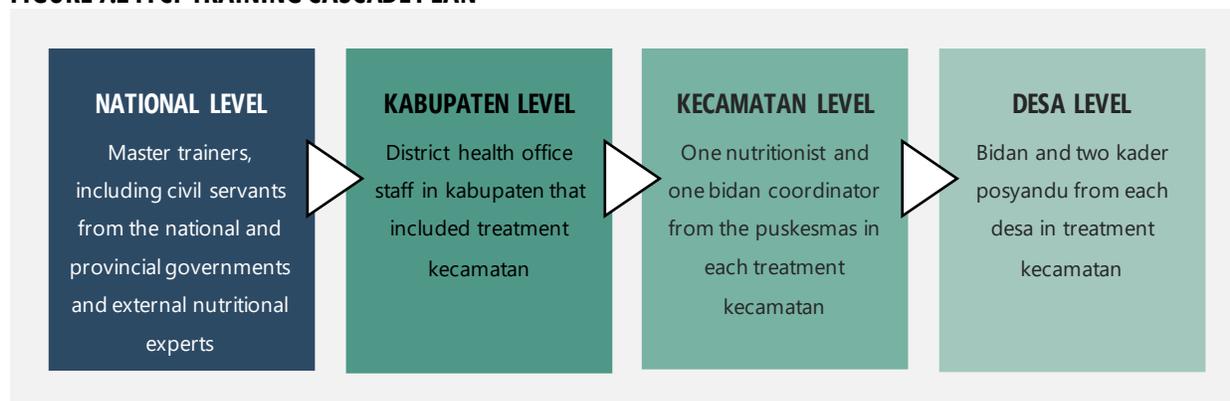
## 7.1 IYCF training

MCA-I supported IYCF training for health staff at the national, provincial, kabupaten, kecamatan, and desa levels through a cascade model (Figure 7.2). At the lower levels of the cascade, kabupaten health staff trained one nutritionist and one bidan coordinator per puskesmas in treatment kecamatan. They, in turn, trained in each desa the one civil servant designated as the bidan (the bidan desa) as well as two out of several kader posyandu.<sup>36</sup> (The nutritionist and bidan coordinator in a given puskesmas typically attended the same puskesmas-level training, and the bidan and kader posyandu in a given desa typically attended the same desa-level training.)

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<sup>36</sup> Each desa typically comprises more than one dusun, each of which has a posyandu. There are two kader per posyandu, and therefore more than two kader in each desa, but the Nutrition Project only trained two.

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**FIGURE 7.2 IYCF TRAINING CASCADE PLAN**

MCA-I adapted the content for the IYCF training from a United Nations Children’s Fund (UNICEF) manual. The training covered a variety of technical topics related to breastfeeding, complementary feeding, growth monitoring, and women’s nutrition. It covered the first two topics in particular detail. On breastfeeding, the training provided information on topics such as early initiation of breastfeeding, the benefits of breastfeeding and the risks of not breastfeeding, exclusive breastfeeding, breastfeeding frequency, breastfeeding techniques, and common breastfeeding problems and how to address them. On complementary feeding, the training provided detailed guidance on frequency, amount, texture, and variety, and how to adapt these with the child’s age, starting at 6 months old and accompanied by continued breastfeeding.

Over and above sharing technical information, the training also sought to increase providers’ counseling capabilities. It included modules on counseling clients individually and on two types of group counseling, kelas ibu hamil (for pregnant women) and kelas balita (for caregivers of young children). The training manual provided guidance on how to use interactive methods to ensure participants understood and internalized the above information. Recommended interactive methods included group work, role play, discussions, demonstrations, and practice.

As we discuss in Chapter 1, MCA-I sought to train approximately 18,600 provincial officials, kabupaten representatives, and other providers in IYCF, and managed to train approximately 17,500. (Targets were met for provincial officials, puskesmas staff, and kader posyandu, but not for kabupaten representatives and bidan.) Training started on schedule in some areas but was substantially delayed in others. This meant that providers in some areas did not receive training until the end of the Compact, after other activities had already been completed. These delays have implications for realizing steps in the theory of change since it was expected that the effects of the IYCF training would synchronize with the effects of other Project components, especially Generasi.

Below we report results on who was trained in IYCF, over what timeframe, and who funded these trainings, as well as training duration, content, and methods. Detailed results are in Appendix B Tables 7.1–7.17.

### 7.1.1 Training participants and timing

As mentioned above, the participants in IYCF trainings at the lower levels of the cascade—who would have direct contact with mothers and caregivers—were puskesmas staff (specifically, bidan coordinators and nutritionists), as well as bidan and kader posyandu. Here we describe in more detail who attended training and when.

**Providers were substantially more likely to have received IYCF training in treatment areas compared to control areas.** At endline, about 70 percent of bidan coordinators and nutritionists in treatment areas reported that they had been trained in IYCF since 2014 (Figure 7.3).<sup>37</sup> These proportions were substantially higher than in control areas, by a statistically significant 35 and 27 percentage points, respectively. At the desa level, about 60 percent of bidan and kader posyandu in treatment areas reported that they had received such training, both about a statistically significant 40 percentage points higher than in control areas.

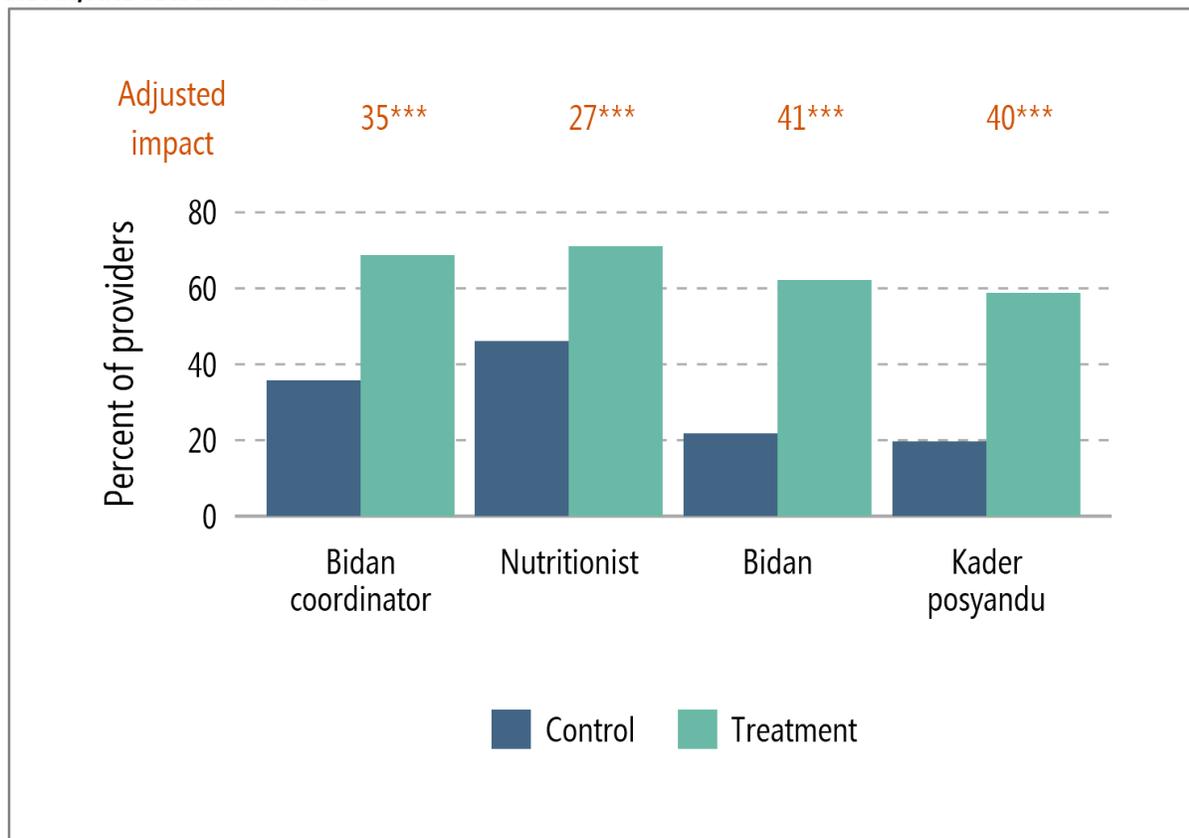
We also asked kabupaten representatives in the 22 study kabupaten about IYCF trainings not funded by MCA-I that were held in their kabupaten. Several kabupaten representatives mentioned other trainings (supported by the DHO or other entities), although others mentioned that there were no other trainings. Where these other trainings occurred, they tended to target areas that did not benefit from MCA-I trainings (control areas) and often focused only on providers at the puskesmas level. This is consistent with the higher training rates for puskesmas-level providers compared to desa-level providers in control areas, based on providers' reports.

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<sup>37</sup> In this section we consider only IYCF trainings lasting more than half a day because comprehensive IYCF training like that provided by the Project is designed to last several days.

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**FIGURE 7.3 PROVIDERS TRAINED IN IYCF SINCE 2014, AS REPORTED BY BIDAN COORDINATORS, NUTRITIONISTS, BIDAN, AND KADER POSYANDU**



Source: Bidan coordinator, nutritionist, bidan, and kader posyandu endline surveys

Sample size: 239 bidan coordinators, 239 nutritionists, 778 bidan, and 1,685 kader posyandu

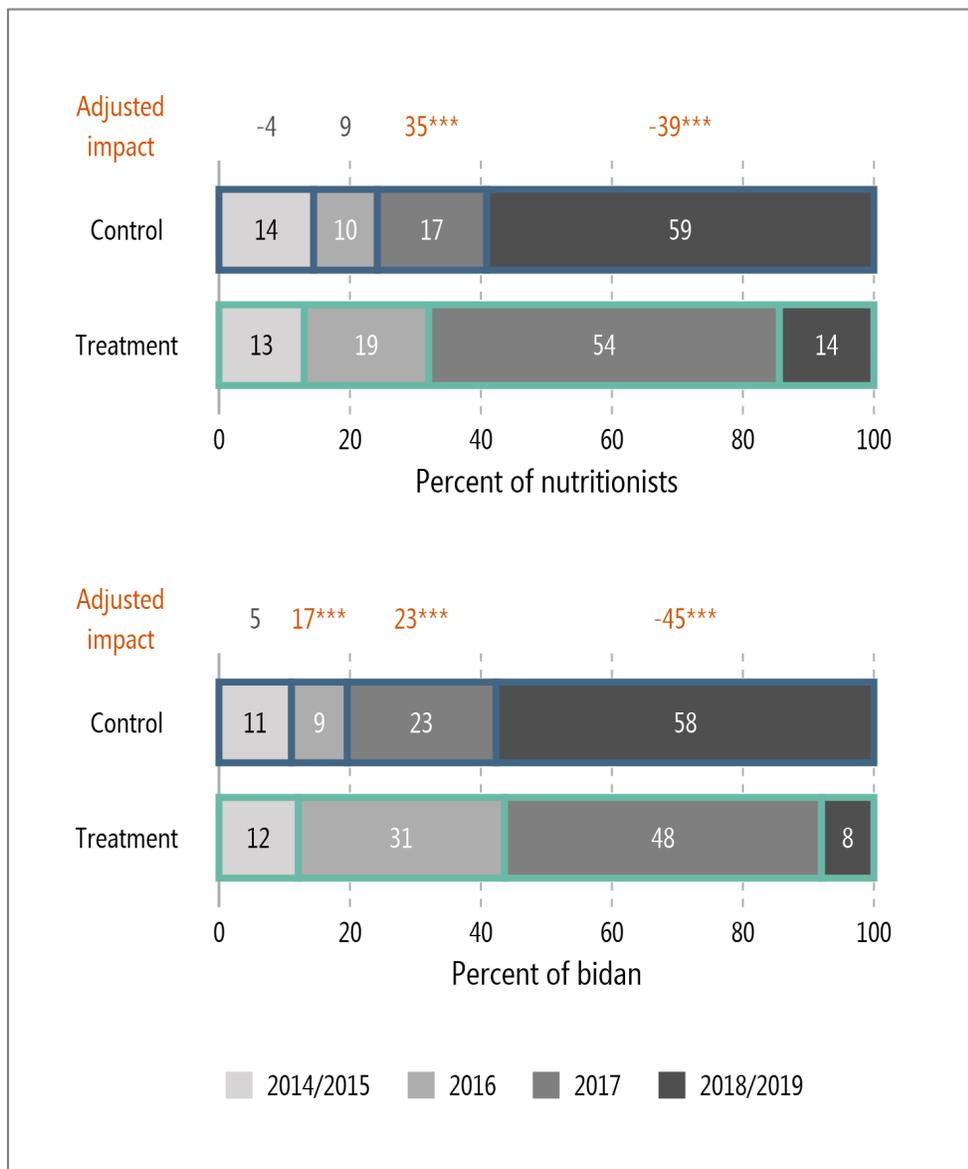
\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**Most commonly, providers in treatment areas received IYCF training in 2017; there is some evidence of a more recent catch-up in training in control areas.** More than half of nutritionists in the treatment group who were trained in IYCF since 2014 received their most recent training in 2017 (Figure 7.4).<sup>38</sup> (The survey only asked about the most recent training; all types of providers reported having received between one and two IYCF trainings since 2014, on average.) Compared to the control group, nutritionists in the treatment group were substantially more likely to have received training in 2017 (by a statistically significant 35 percentage points) and substantially less likely to have received training in 2018/2019 (by a statistically significant 39 percentage points). This pattern was broadly similar for all other types of providers, although bidan and kader posyandu in the treatment group were also significantly more likely than those in the control group to have received training in 2016.

<sup>38</sup> In Figures 7.4 and 7.6 we present findings for nutritionists and bidan only, for visual clarity (these are the puskesmas and desa-level respondents with the highest rates of IYCF training participation). In these cases, we discuss the results for bidan coordinators and kader posyandu in the text; the detailed findings for all types of providers are in Appendix B.

These findings are consistent with the delayed implementation of Project IYCF training in many treatment areas until close to the end of the Compact. They also suggest that control areas recently started to close the gap in IYCF training with treatment areas; however, as we showed above, the gap at endline was still large.

**FIGURE 7.4 YEAR IN WHICH PROVIDERS WERE MOST RECENTLY TRAINED IN IYCF, AMONG NUTRITIONISTS AND BIDAN WHO ATTENDED TRAININGS**



Source: Nutritionist and bidan endline surveys

Sample size: 140 nutritionists and 317 bidan

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

### 7.1.4 Training characteristics

Above we examined who was trained in IYCF and when; here we examine features of the trainings, including duration, whether they included on-the-job training (OJT), funders, content, and teaching methods.

#### *Duration and OJT*

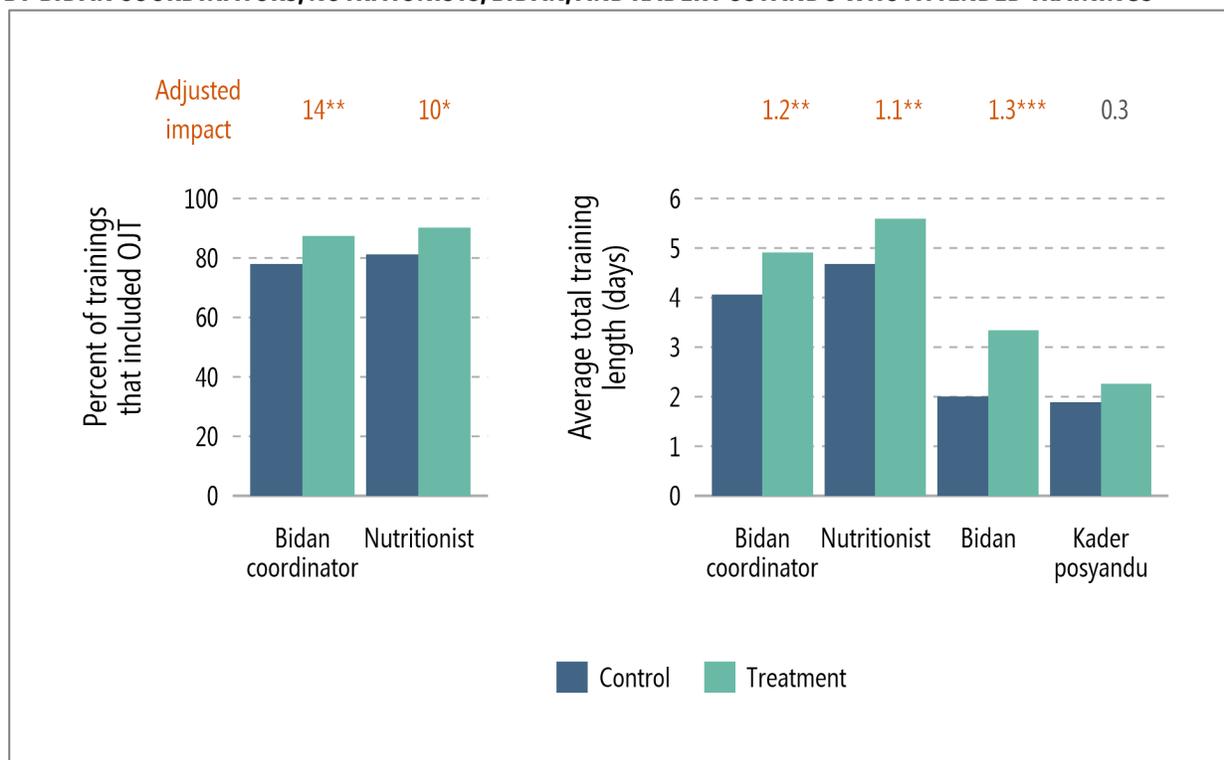
IYCF trainings were envisioned to last between three and eight days for puskesmas staff and three days for bidan and kader posyandu. This difference was due to on-the-job training (OJT) for puskesmas staff, which involved staff conducting a training session for staff at lower administrative levels with an observer, such as someone from the DHO, supervising and providing feedback.

**Trainings for puskesmas-level providers in treatment areas were slightly longer and more likely to include OJT than those in control areas.** According to bidan coordinators and nutritionists in treatment areas, their training lasted on average five or six days, including classroom sessions and OJT. For both these providers, this was about one day longer than trainings reported in control areas, a small but statistically significant difference (Figure 7.5). (This difference was driven by a longer classroom component of the training.) About 90 percent of trainings for these providers were reported to have included OJT; this was higher than in control areas by a statistically significant 14 percentage points for bidan coordinators and a marginally statistically significant 10 percentage points for nutritionists. Nearly all trainings for puskesmas-level providers in both treatment and control areas were conducted on a full-day rather than half-day basis.

**Desa-level trainings in treatment areas were slightly longer than those in control areas, according to bidan reports, and more likely to be conducted on a full-day basis.** According to bidan in treatment areas, their training lasted on average about three days, a statistically significant difference of just over a day relative to control areas (Figure 7.5). However, according to kader posyandu reports, training in treatment areas only lasted on average about two days, and was similar in the control areas. (Although kader posyandu and bidan in treatment areas should have attended the same MCA-I trainings, kader posyandu might have been more likely to attend shorter trainings held by other entities, thus reducing the average length.) Nearly all trainings for bidan and kader posyandu in treatment areas were conducted on a full-day rather than half-day basis, compared to 8 in 10 trainings for bidan and 7 in 10 trainings for kader posyandu in control areas.

Therefore, for both puskesmas- and desa-level providers, training was on average slightly more intensive in treatment than in control areas in terms of length and/or full-day training. Several kabupaten representatives also reported that the MCA-I trainings were typically longer than other IYCF trainings due to the larger budget available for the former.

**FIGURE 7.5 PERCENT OF TRAININGS THAT INCLUDED OJT AND AVERAGE LENGTH OF IYCF TRAINING, AS REPORTED BY BIDAN COORDINATORS, NUTRITIONISTS, BIDAN, AND KADER POSYANDU WHO ATTENDED TRAININGS**



Source: Bidan coordinator, nutritionist, bidan, and kader posyandu endline surveys

Sample size: 226 trainings attended by bidan coordinators, 248 trainings attended by nutritionists, 440 trainings attended by bidan, and 916 trainings attended by kader posyandu

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

### Funding and sustainability

Because we do not have administrative records of every training and the funding source, we rely on respondent reports to examine the funding source for puskesmas and desa-level IYCF trainings in treatment and control areas.<sup>39,40</sup> We also looked at use of the MCA-I manuals for

<sup>39</sup> The survey asked all respondents who funded each of the trainings that they attended. Because we were concerned that respondents' might not accurately remember who funded the training, we sought to obtain alternative measures for MCA-I-funded trainings by asking whether training participants received MCA-I manuals (for kabupaten level respondents) or MCA-I training certificates (for puskesmas- and desa-level respondents). However, there are substantial inconsistencies in individual respondents' reports of MCA-I-funded trainings and the manuals or certificates measures. We view the reports of receiving MCA-I certificates in control areas as implausibly high (between about 20 and 30 percent of providers); it is possible that many respondents were providing socially desirable responses or confusing the MCA-I certificate with other certificates. Therefore, we rely on respondents' reports about the funder, as this is likely the most accurate measure we have.

<sup>40</sup> In addition to comparing the characteristics of trainings in treatment areas to control areas, we intended to compare trainings funded by MCA-I to those not funded by MCA-I (regardless of where they were conducted). However, given the challenges in accurately identifying MCA-I trainings discussed in the previous footnote, we

non-MCA-I trainings as a measure of sustainability of the MCA-I manuals, which could imply that the Project had positive spillovers on other IYCF trainings.

**MCA-I was the primary funder of IYCF trainings in treatment areas.** At the kabupaten level (which includes treatment and control areas), DHOs report that about three-quarters of trainings at both the puskesmas and desa levels were funded by MCA-I. Examining reports from providers, more than 80 percent of bidan coordinators and nutritionists in the treatment group who had attended IYCF training since 2014 reported attending an MCA-I-funded training, both substantially higher than the rates in control areas (by a statistically significant 75 and 64 percentage points, respectively). These patterns were similar for desa-level providers. Specifically, about 63 percent of bidan and 38 percent of kader posyandu reported attending an MCA-I-funded training, a statistically significant 54 and 31 percentage points higher than the respective proportions in the control areas.

At the training level—that is, taking the average over all IYCF trainings reported by respondents since 2014—puskesmas-level providers reported that about 8 in 10 IYCF trainings conducted in treatment areas were funded by MCA-I (Figure 7.6). This was substantially higher than the proportions in control areas (2 in 10 for nutritionists and 1 in 10 for bidan coordinators). In contrast, the primary funder in control areas was the DHO. For desa-level trainings, providers in treatment areas reported that MCA-I funded about 6 in 10 bidan IYCF trainings and 3 in 10 kader posyandu IYCF trainings, compared to almost none in control areas. In control areas, the DHO and puskesmas were the primary funders of desa-level trainings, although the DHO was also an important funder in treatment areas.

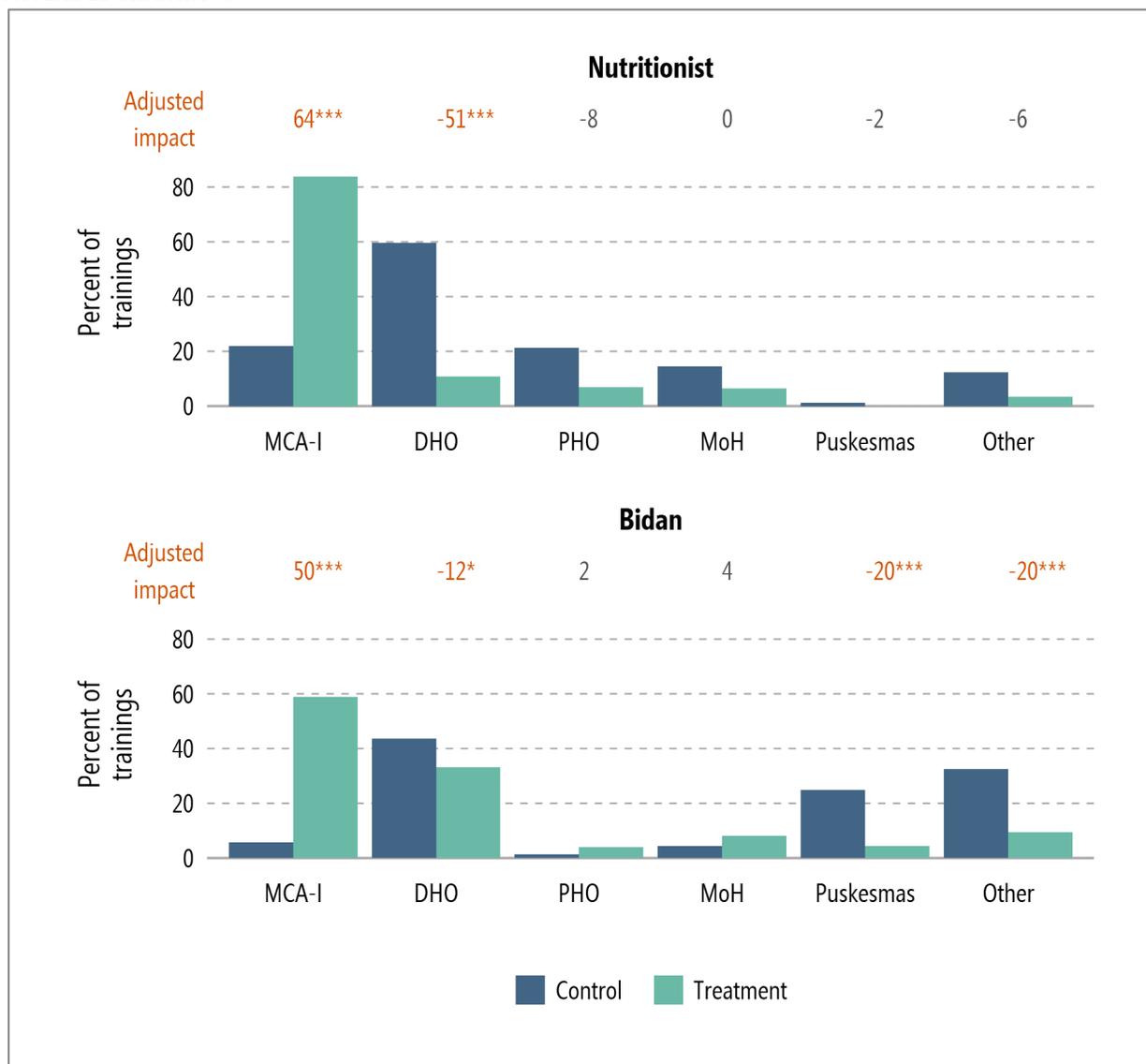
Overall, these findings confirm that MCA-I played a major role in funding IYCF trainings in the treatment areas since 2014, facilitating the large increase in training participation discussed earlier.

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do not present those findings in the body of the report. Tables with these findings (using training participants' reports of who funded training) are included in Appendix B.

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**FIGURE 7.6 FUNDING SOURCES FOR IYCF TRAININGS, AS REPORTED BY NUTRITIONISTS AND BIDAN WHO ATTENDED TRAININGS**



Source: Bidan and nutritionist endline surveys

Sample size: 422 trainings attended by bidan and 248 trainings attended by nutritionists

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**There is some evidence that a substantial proportion of trainings not funded by MCA-I used MCA-I manuals.** As mentioned earlier, we looked at the use of MCA-I manuals as a measure of spillover and sustainability. Kabupaten representatives reported that approximately 44 percent of trainings at the puskesmas level and almost all trainings at the desa level that were not funded by MCA-I used MCA-I manuals. Several kabupaten representatives also reported qualitatively that other trainings not funded by MCA-I used the MCA-I materials. Overall, it

appears that other trainings were borrowing MCA-I content, although this is difficult to quantify precisely given possible inaccuracies in kabupaten reports of the use of MCA-I manuals.<sup>41</sup>

The use of MCA-I manuals in other trainings potentially has implications for the ability of the evaluation to detect differences between the treatment and control groups. More specifically, if trainings in treatment and control groups were substantively similar, these similarities could dampen the estimated impacts on outcomes such as provider knowledge and child health. However, these spillovers are unlikely to have a substantial effect on the impact estimates, for two main reasons. First, even if the training curriculum was similar in treatment and control areas, there was still a large difference in training participation rates that should result in impacts if the training was effective. Second, kabupaten representatives noted that where MCA-I manuals were used in other trainings, trainers' ability to cover all the MCA-I content and use similar training methods was often limited by a lack of funds. Therefore, MCA-I trainings could still be substantively different from other trainings even if both used the same manuals.

### *Training content*

The survey explored what topics were covered in the trainings because training content is the foundation of improving providers' knowledge of key IYCF topics and their capacity to communicate relevant behavior change messages to households. (Figure 7.7 shows the topics that were supposed to be covered in IYCF trainings, based on the training materials.)

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<sup>41</sup> Comparing kabupaten representatives' reports about who funded training and the use of MCA-I manuals in training, about 20 percent of MCA-I funded trainings did not use these manual, whereas they all should have.

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**FIGURE 7.7 IYCF TRAINING TOPICS**

<p><b>Breastfeeding</b></p> <ul style="list-style-type: none"> <li>Exclusive breastfeeding during the first 6 months</li> <li>Breastfeeding on demand, 8-12 times per day/night</li> <li>Anatomy of breast and production of breastmilk</li> <li>Proper breastfeeding position</li> <li>Risks of not breastfeeding for children and mothers</li> <li>Good attachment</li> <li>Importance of colostrum</li> <li>How to pump breastmilk/hand express breastmilk and cup feed</li> <li>Feeding a low birthweight or premature baby</li> <li>Kangaroo mother care</li> <li>Identifying and addressing common problems</li> <li>Re-lactation</li> <li>Baby refusing to breastfeed</li> <li>Breastfeeding twins</li> <li>Nutrition for pregnant and breastfeeding mothers</li> <li>Breastfeeding while pregnant</li> <li>What to do about breastfeeding if mother is away from baby</li> <li>Reasons for baby crying</li> <li>Whether mother's stress influences breastfeeding</li> <li>Whether mother should breastfeed when she is sick</li> <li>Breastfeeding when the baby is sick</li> <li>Inverted nipple</li> </ul>	<p><b>Complementary Feeding</b></p> <ul style="list-style-type: none"> <li>Importance of continuing breastfeeding after age 6 months</li> <li>Start complementary feeding when the baby is 6 months old</li> <li>Frequency, amount, texture, and variety</li> <li>Food variety</li> <li>4-star diet, iodized salt, no sugary drinks</li> <li>Local foods, fortification and supplementation</li> <li>Correlation between child feeding and sickness</li> <li>Feeding a sick child over 6 months old</li> <li>5 ways of maintaining hygiene when preparing foods</li> <li>How to add micronutrient powder to complementary foods</li> <li>Feeding by age (6-9 months old; 9-12 months old; 12-24 months old)</li> </ul>
<p><b>Counseling</b></p> <ul style="list-style-type: none"> <li>3 steps of IYCF counseling</li> <li>How to conduct action-oriented groups<sup>a</sup></li> <li>How to lead IYCF support groups<sup>b</sup></li> <li>How to listen to and analyze what client is sharing</li> <li>How to integrate IYCF support into community health services</li> <li>Skills to build self-esteem and provide encouragement</li> <li>Scheduling counseling sessions</li> <li>Phases of behavioral change</li> <li>Practice counseling individual clients</li> <li>Practice conducting action-oriented groups</li> <li>Practice conducting IYCF support groups</li> </ul>	<p><b>Other</b></p> <ul style="list-style-type: none"> <li>Definition of IYCF</li> <li>IYCF data (showing nutritional status of country)</li> <li>How to prevent undernutrition/undernutrition cycle</li> <li>Ideal environment for healthy, well-nourished children</li> <li>Pregnant women/delivery in a facility</li> <li>Good hygiene to prevent disease</li> <li>Birth spacing and Lactational Amenorrhea Method (LAM) family planning method</li> <li>Family planning to promote improved health and survival of the mother and child</li> <li>Growth measurement instructions regular growth monitoring and promotion</li> <li>How to fill out the KMS card</li> <li>Father's role before, during, and after child's birth</li> <li>When to take child to health facility</li> </ul>

Source: UNICEF's IYCF training manual and counseling cards

Notes: The Indonesian version of the module did not include two modules in the master UNICEF manual, including a module on IYCF in the context of HIV and a module on building country, regional, and district action plans.

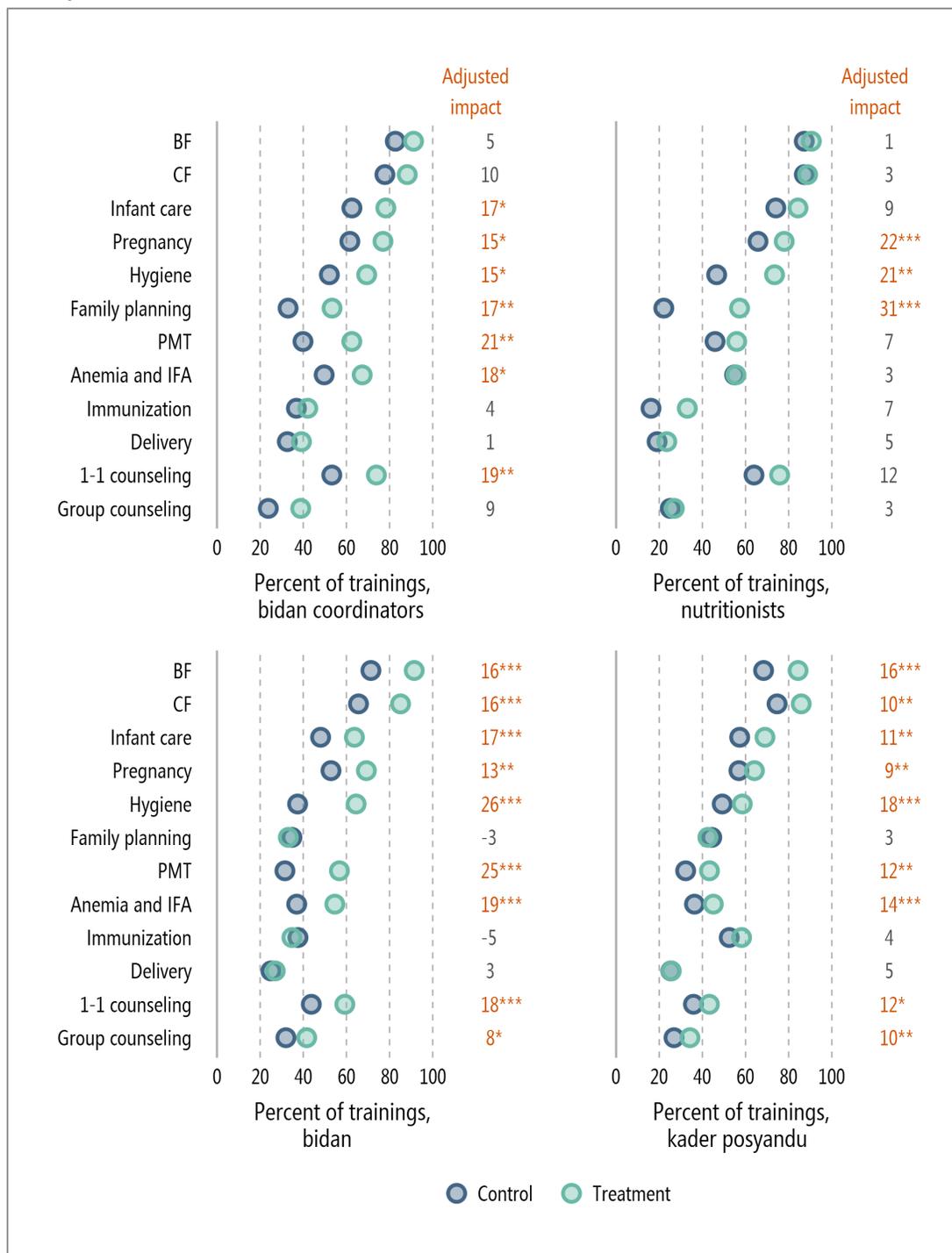
<sup>a</sup> Action-oriented groups begin by the facilitator sharing a story, conducting a mini-drama or role play, or using a visual. Then she asks group participants what they *observed*, asks them to share what they *think*, asks them if they would be willing to *try* the practice, and asks them if they could *act* the same way.

<sup>b</sup> IYCF support groups provide a setting for new mothers to share their infant feeding experience, and support one another.

**The IYCF trainings conducted in treatment areas covered a wider range of topics than those conducted in control areas, especially for desa-level trainings.** Across all types of puskesmas- and desa-level providers, the most common IYCF training topics recalled by training participants in the treatment group were breastfeeding and complementary feeding, which were the focus of the MCA-I trainings; about 9 in 10 trainings covered these topics (Figure 7.8). For puskesmas-level providers, these topics were discussed at a similarly high rate in control area trainings, but for desa-level providers they were significantly more likely to be discussed in treatment area trainings (by between 10 and 16 percentage points, depending on the topic and provider).

In addition to breastfeeding and complementary feeding, IYCF trainings covered a wide variety of other maternal and child health topics. For desa-level trainings, many of these topics—for example, pregnancy, maternal anemia and IFA, infant care, PMT, and hygiene/handwashing—were significantly more likely to be covered in treatment area trainings compared to control area trainings. (The magnitude of these differences for specific topics was typically between about 10 and 25 percentage points.) For puskesmas-level trainings, there were fewer statistically significant impacts on other training topics besides breastfeeding and complementary feeding (in part because of the smaller sample sizes). Nevertheless, there were several large and statistically significant impacts for specific topics.

**FIGURE 7.8 TOPICS COVERED IN IYCF TRAININGS, AS REPORTED BY BIDAN COORDINATORS, NUTRITIONISTS, BIDAN, AND KADER POSYANDU WHO ATTENDED TRAININGS**



Source: Bidan coordinator, nutritionist, bidan, and kader posyandu endline surveys

Sample size: 226 trainings attended by bidan coordinators, 251 trainings attended by nutritionists, 440 trainings attended by bidan, and 916 trainings attended by kader posyandu

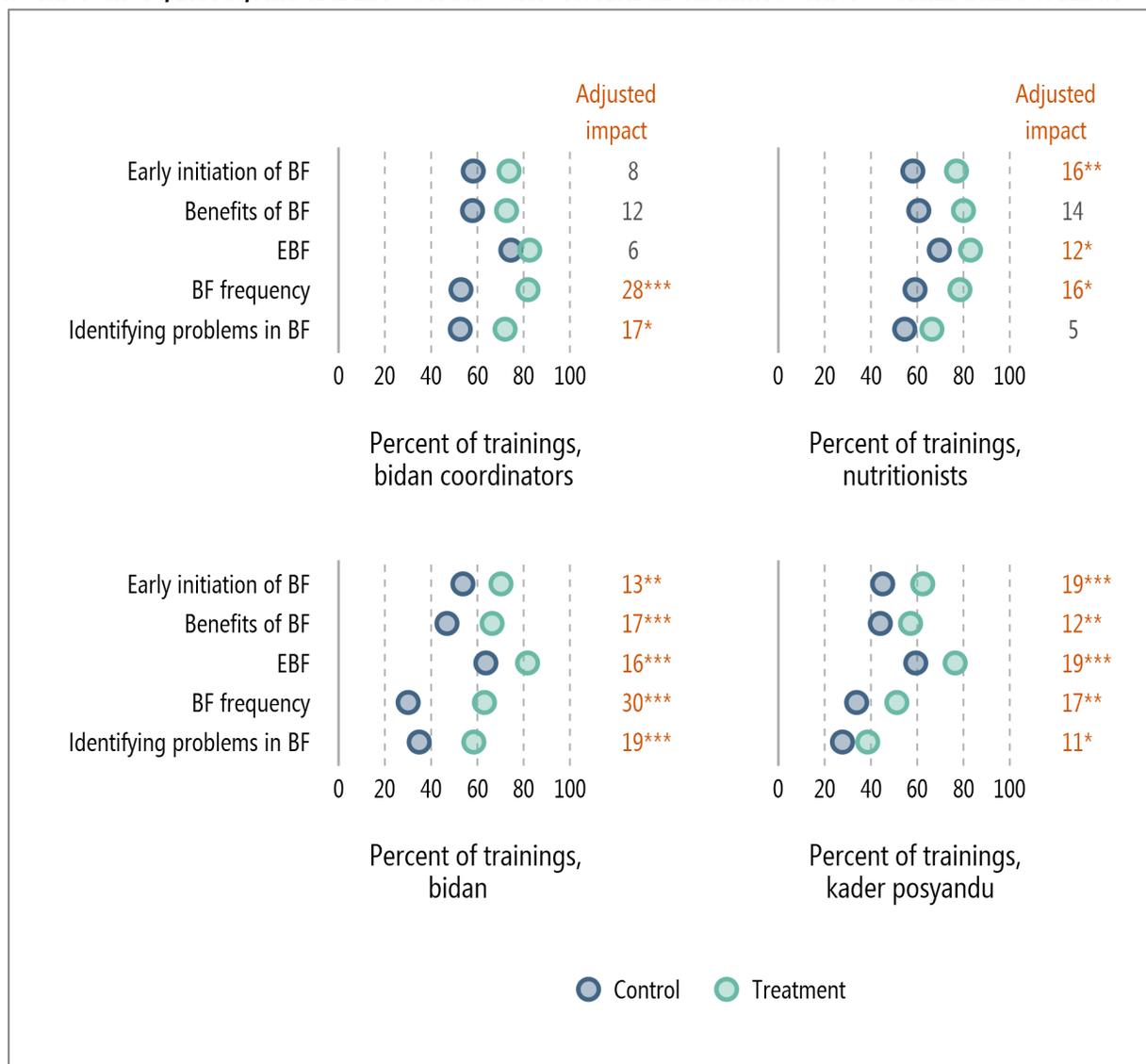
\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**IYCF trainings conducted in treatment areas were more likely to cover specific breastfeeding-related topics than those conducted in control areas.** Because breastfeeding was an important focus of the training (based on the training materials, most training time was spent on breastfeeding), we also examined specific breastfeeding-related topics in more detail. These included early initiation of breastfeeding, benefits of breastfeeding (and risks of not breastfeeding), exclusive breastfeeding, breastfeeding frequency, and identifying and addressing common breastfeeding problems. Consistent with the overall impact on covering breastfeeding during desa-level trainings, these trainings were significantly likely to include discussion of almost all breastfeeding topics we asked about, by between 10 and 30 percentage points (Figure 7.9).

For puskesmas-level providers, the treatment-control differences in topics discussed were generally positive but mostly smaller and lower in statistical significance than those for desa-level providers (in part because of the smaller sample sizes). Nevertheless, there were some substantial differences; for example, bidan coordinators in treatment areas were a statistically significant 28 percentage points more likely to report that the training covered breastfeeding frequency compared to those in control areas. Overall, these findings suggest that the Project had the potential to increase provider knowledge about specific aspects of breastfeeding even though breastfeeding was covered in the vast majority of IYCF trainings in both treatment and control areas.

Kabupaten representatives also reported qualitatively that MCA-I trainings were more comprehensive than other IYCF trainings. For example, some other trainings focused exclusively on breastfeeding, and others did not cover counseling (although as we show below, counseling might not have been covered to the extent envisaged in the MCA-I trainings). As mentioned earlier, even when other trainings used the MCA-I manuals, it was often not possible for them to cover all topics in detail because budget constraints limited the duration and training.

**FIGURE 7.9 BREASTFEEDING TOPICS COVERED IN IYCF TRAININGS, AS REPORTED BY BIDAN COORDINATORS, NUTRITIONISTS, BIDAN, AND KADER POSYANDU WHO ATTENDED TRAININGS THAT COVERED BREASTFEEDING**



Source: Bidan coordinator, nutritionist, bidan, and kader posyandu endline surveys  
 Sample size: 226 trainings attended by bidan coordinators, 251 trainings attended by nutritionists, 440 trainings attended by bidan, and 916 trainings attended by kader posyandu  
 \* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**Many desa-level participants in treatment areas did not recall receiving training on one-on-one or group counseling approaches.** As mentioned earlier, the MCA-I training covered not only IYCF content but also client counseling approaches. Desa-level trainings in treatment areas were more likely than those in control areas to cover one-on-one counseling approaches (by a statistically significant 18 percentage points for bidan and a marginally significant 12 percentage points for kader posyandu) and group counseling approaches (by a statistically significant 10 percentage points, for kader posyandu only) (Figure 7.8). However, a large proportion of

participants in treatment areas did not recall these key counseling-related topics, which were intended to be an integral part of trainings to help providers engage households in behavior change. Specifically, only about 6 in 10 trainings reported by bidan and 4 in 10 trainings reported by kader posyandu in treatment areas covered one-on-one counseling, and only about 3 in 10 trainings reported by these providers covered group counseling, according to providers' reports. Coverage of one-on-one counseling during training was higher for puskesmas-level respondents; it was reported to have been covered in more than 7 in 10 puskesmas-level trainings in treatment areas (a statistically significant impact of 19 percentage points for bidan coordinators, but no significant impact for nutritionists).

The training materials indicate that the training included a lot of content on one-on-one counseling—for example, “listening and observation skills” and “building mother’s confidence and giving support” (Ministry of Health of the Republic of Indonesia 2014)—so it is surprising that this aspect of the training was not reflected in respondents’ reports about training content. It is possible that this was in practice less of a focus of the training, or that participants did not mention it because it was integrated into the training sessions on content. The finding on limited group counseling training is consistent with the interim report (Beatty et al. 2018), in which we found that in practice participants received relatively little guidance on how to conduct group counseling.

### *Teaching methods*

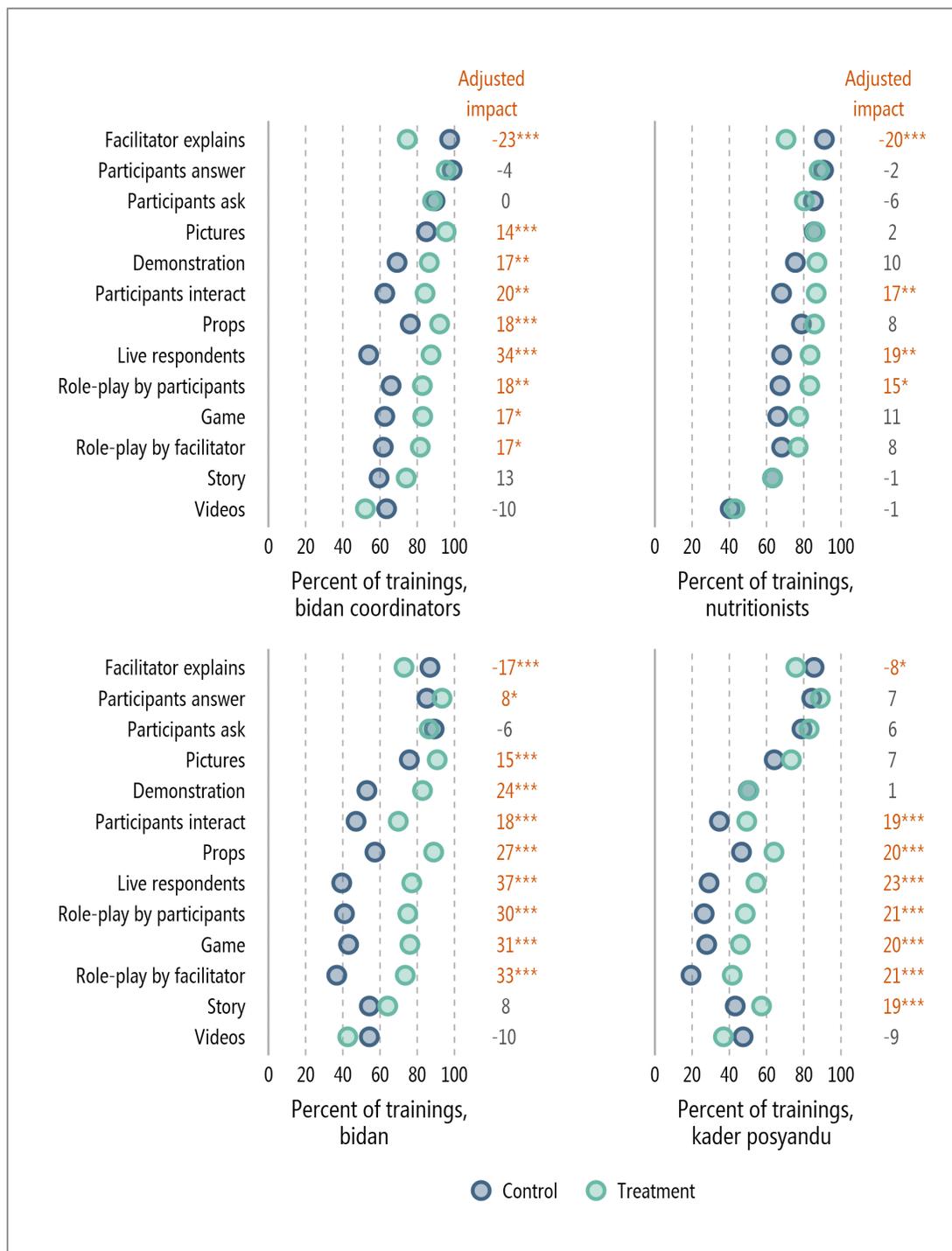
MCA-I not only slightly modified the UNICEF IYCF training content but also intended that their training would employ different methods to ensure that participants absorbed the material. Here we examine the teaching methods used in treatment and control areas.

**Non-traditional methods such as props, games, and interactive methods distinguished the IYCF trainings in treatment areas.** The most common teaching methods used in IYCF trainings in the control group were traditional methods: facilitators giving explanations, facilitators asking questions, and participants asking questions (Figure 7.10). In contrast, trainings in the treatment group were significantly less likely to involve facilitators simply giving explanations (by between 8 and 23 percentage points, depending on the provider), and were more likely to involve non-traditional methods. Specifically, methods such as using models or props (for example, a model of a breast to show how to express breastmilk), games, role-playing by the facilitator and/or training participants, practicing with “live” participants, brainstorming or opinion sharing activities, and participants practicing when a facilitator demonstrated a technique or action were substantially more common in the treatment group for many providers. The difference between the treatment and control groups in the use of specific types of non-traditional methods varied across providers, but for most methods the differences were between 15 and 35 percentage points and statistically significant.

In qualitative responses, kabupaten representatives consistently noted the more interactive nature of MCA-I trainings compared to other trainings as a distinguishing feature of the former. For example, one reported that “MCA-I facilitators gave elaborate explanation on how to address problems they might encounter and followed with practice; meanwhile, DHO facilitators only

delivered materials without practice.” Even when other trainings did adopt MCA-I materials, they were often unable to include non-traditional teaching methods, such as games, or provide sufficient time for practice due to budget constraints.

**FIGURE 7.10 TEACHING METHODS USED AT CLTS TRAININGS, AS REPORTED BY BIDAN COORDINATORS, NUTRITIONISTS, BIDAN, AND KADER POSYANDU WHO ATTENDED TRAININGS**

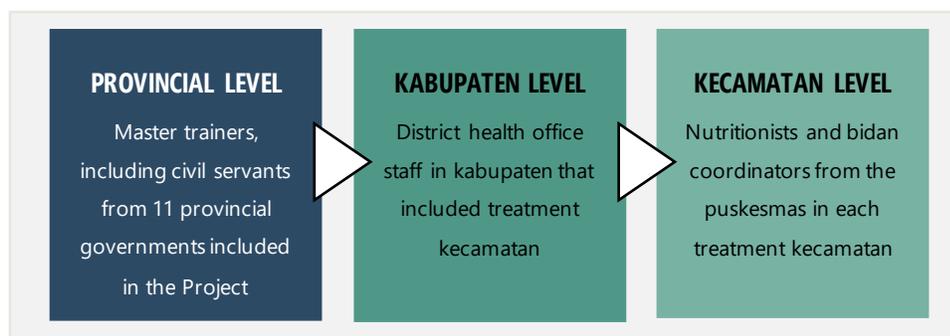


Source: Bidan coordinator, nutritionist, bidan, and kader posyandu endline surveys  
 Sample size: 226 trainings attended by bidan coordinators, 251 trainings attended by nutritionists, 440 trainings attended by bidan, and 916 trainings attended by kader posyandu  
 \* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

## 7.2 Growth monitoring training

Another critical supply-side activity under the Nutrition Project was growth monitoring training. As with IYCF, MCA-I supported growth monitoring training for health staff at the national, provincial, kabupaten, and kecamatan levels through a cascade model (Figure 7.11). At the lower level of the cascade, the intended recipients of this five-day training included bidan coordinators, and nutritionists at the puskesmas level.

**FIGURE 7.11 GROWTH MONITORING TRAINING CASCADE PLAN**



The Project revised the current Ministry of Health (MoH) growth monitoring training curriculum, which had been used to train health workers since 2007. The revisions integrated the previous modules developed by the World Health Organization (WHO) into a single module on growth monitoring, with a focus on technical growth assessment, interpreting the results, and follow-up counseling. The revisions also added two modules on case management of severe acute undernutrition and case management of moderate undernutrition, with a focus on growth assessment and nutrition rehabilitation by preparing healthy food.

Similar to the analysis for IYCF trainings, below we report results on who was trained in growth monitoring, over what timeframe, and who funded these trainings, as well as training duration, content, and methods. We focus on the puskesmas-level trainings for bidan coordinators and nutritionists, whose job function (especially for nutritionists) was conducting regular growth monitoring of children who came to the puskesmas and/or the posyandu in the catchment area of the puskesmas. Detailed results are in Appendix B Tables 7.18–7.27.

### 7.2.1 Training participants and timing

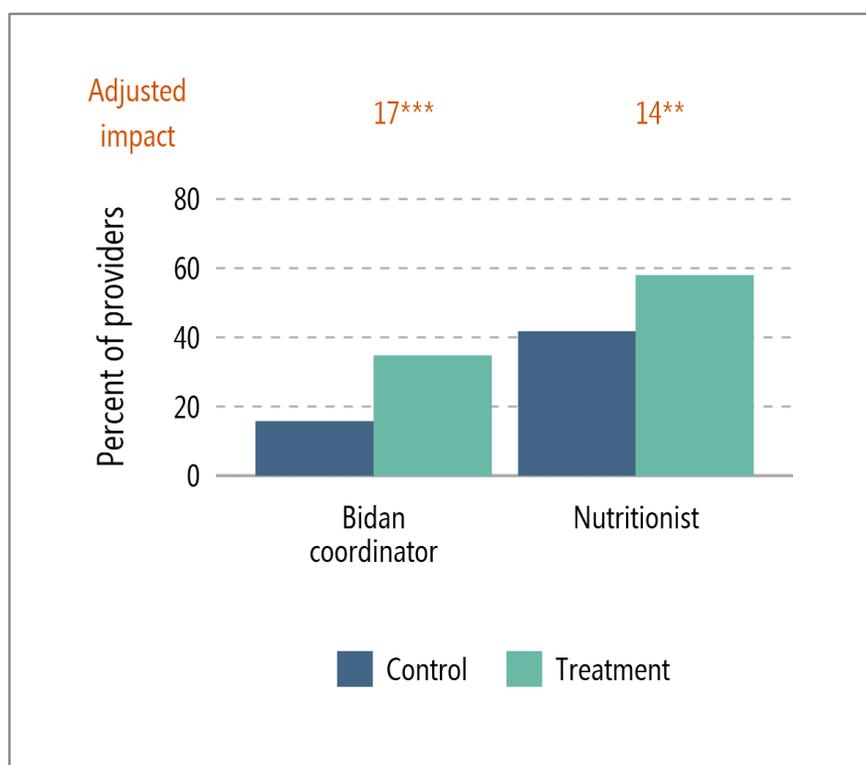
Here we describe in more detail the extent to which puskesmas-level providers attended growth monitoring training and when.

**Providers were more likely to have received growth monitoring training in treatment areas compared to control areas, but only modestly so.** At endline, about 35 percent of bidan coordinators and 58 percent of nutritionists in treatment areas reported that they had been trained

in growth monitoring since 2014 (Figure 7.12).<sup>42</sup> These were both higher than the rates in control areas (a statistically significant 17 and 14 percentage points, respectively). In both the treatment and control groups, providers who attended growth monitoring training since 2014 reported having received slightly more than one training, on average.

Growth monitoring training was much less common based on kabupaten representatives' reports. In qualitative responses, these representatives reported that relatively few growth monitoring trainings were conducted outside of the areas where MCA-I conducted training. It is possible that some providers reported the initial training that they received during their education or when they started their jobs rather than large-scale training efforts, increasing the reported rate of training in control areas.

**FIGURE 7.12 PROVIDERS TRAINED IN GROWTH MONITORING SINCE 2014, AS REPORTED BY BIDAN COORDINATORS AND NUTRITIONISTS**



Source: Bidan coordinator and nutritionist endline surveys

Sample size: 242 bidan coordinators and 240 nutritionists

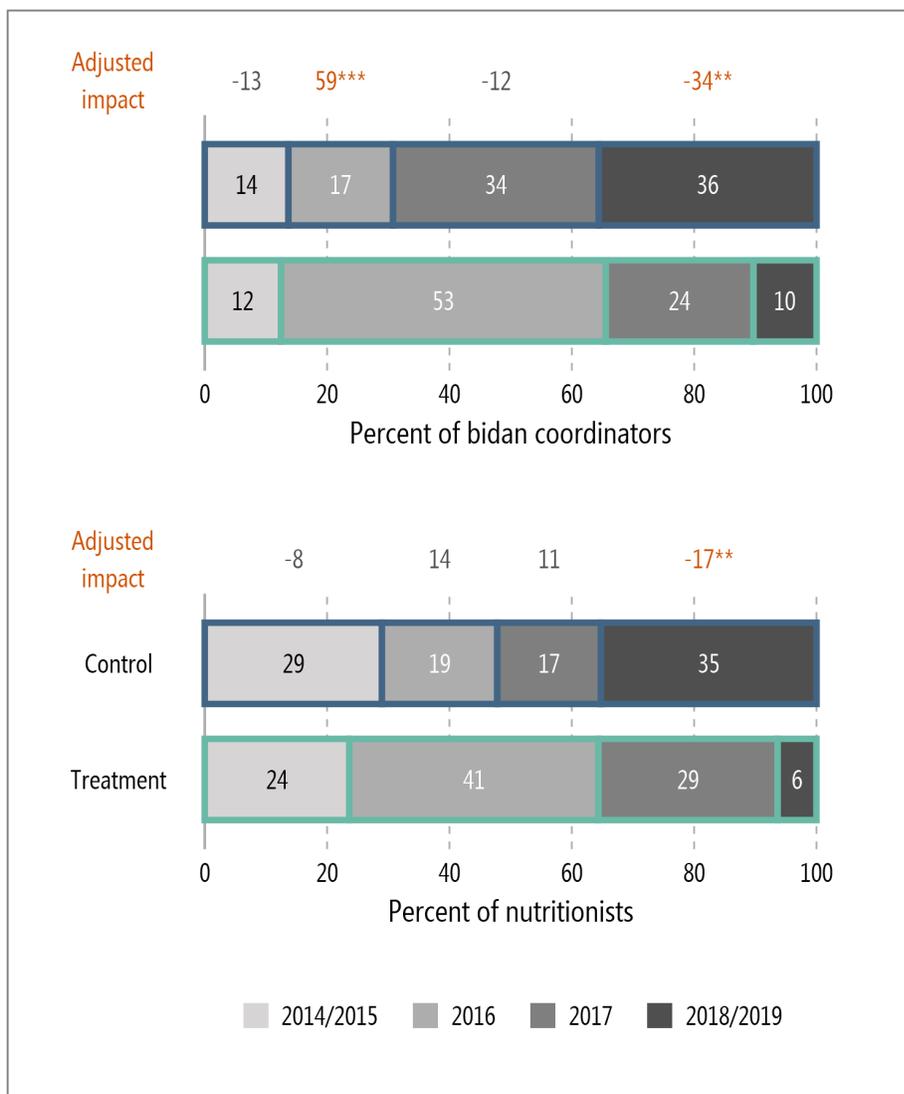
\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**In treatment areas most providers were trained in 2016 or 2017; there is some evidence of a more recent catch-up in trainings in control areas.** About three-quarters of bidan coordinators and nutritionists in the treatment group who were trained in growth monitoring since 2014

<sup>42</sup> In this section we consider only growth monitoring trainings lasting more than half a day because comprehensive growth monitoring training like that provided by the Project is designed to last several days.

received their most recent training in 2016 or 2017, most commonly in 2016 (Figure 7.13). Providers in the control group were more likely to have received training in 2018/2019 than those in the treatment group (by a statistically significant 34 percentage points for bidan coordinators and 17 percentage points for nutritionists). This suggests that control areas recently started to close the gap in growth monitoring training with treatment areas, contributing to the modest magnitude of the gap at endline.

**FIGURE 7.13 YEAR IN WHICH PROVIDERS WERE MOSTLY RECENTLY TRAINED IN GROWTH MONITORING, AMONG BIDAN COORDINATORS AND NUTRITIONISTS WHO ATTENDED TRAININGS**



Source: Bidan coordinator and nutritionist endline surveys  
 Sample size: 59 bidan coordinators and 119 nutritionists  
 \* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

### 7.2.4 Training characteristics

Here we examine features of the growth monitoring trainings, similar to those we examined for IYCF trainings.

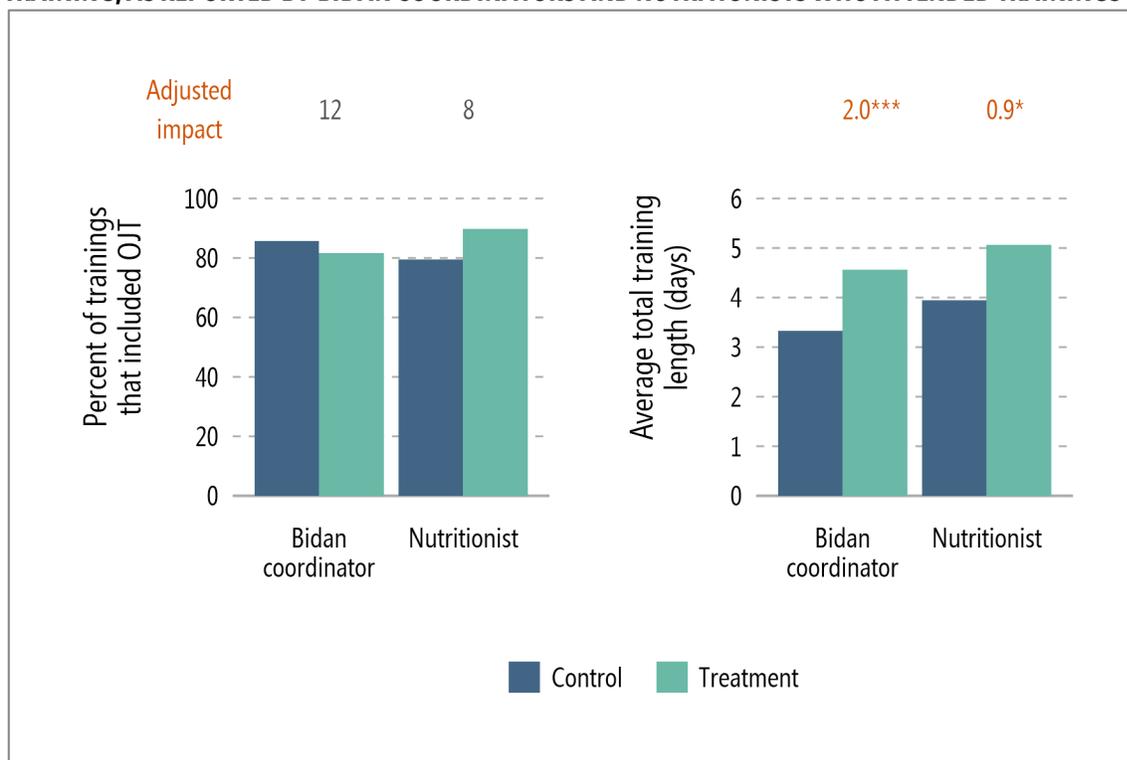
#### *Duration and OJT*

Growth monitoring trainings were envisioned to last seven days, and included time for “live practice” of measurement and counseling with children and mothers in the field (which we view as OJT).

**Growth monitoring trainings in treatment areas were slightly longer than those in control areas.** According to bidan coordinators and nutritionists in treatment areas, their training lasted about five days, on average, including classroom sessions and OJT. For both providers, this was slightly longer than trainings reported in control areas, a statistically significant difference of about two days for bidan coordinators and one day for nutritionists (Figure 7.14). Between 80 and 90 percent of trainings in the treatment and control groups were reported to have included OJT, and there was no statistically significant difference between the two groups. (The number of growth monitoring trainings was much smaller than the number of IYCF trainings, making it more difficult to detect modest impacts.) Nearly all trainings in both treatment and control areas were conducted on a full-day rather than half-day basis.

In qualitative responses, kabupaten representatives confirmed that growth monitoring trainings funded by MCA-I were typically longer than those funded by other entities like the DHO, because the former had more resources available. (Although, as mentioned earlier, relatively few kabupaten representatives reported non-MCA-I trainings.) They noted that the longer duration of MCA-I trainings provided participants with more opportunity to practice what they learned relative to other trainings.

**FIGURE 7.14 PERCENT OF TRAININGS THAT INCLUDED OJT AND AVERAGE LENGTH OF GROWTH MONITORING TRAINING, AS REPORTED BY BIDAN COORDINATORS AND NUTRITIONISTS WHO ATTENDED TRAININGS**



Source: Bidan coordinator and nutritionist endline surveys

Sample size: 72 trainings attended by bidan coordinators and 154 trainings attended by nutritionists

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

### Funding

Below we examine the funding source for growth monitoring trainings based on respondents' reports of who funded each training.<sup>43,44</sup>

**MCA-I was the major funder of growth monitoring trainings in treatment areas.** At the kabupaten level, DHOs report that about 9 in 10 growth monitoring trainings were funded by MCA-I. At the provider level, about three-quarters of bidan coordinators and nutritionists in the treatment group who attended growth monitoring training since 2014 reported attending an

<sup>43</sup> Similar to IYCF trainings, we also explored the receipt of MCA-I certificates by providers who participated in training as an alternative measure of MCA-I-funded training. However, given substantial inconsistencies between asking respondents about the funder and the MCA-I certificates measure, as well as implausibly high rates of certificate receipt in control areas (one-third of nutritionists who attended training), we focus on the funder measure.

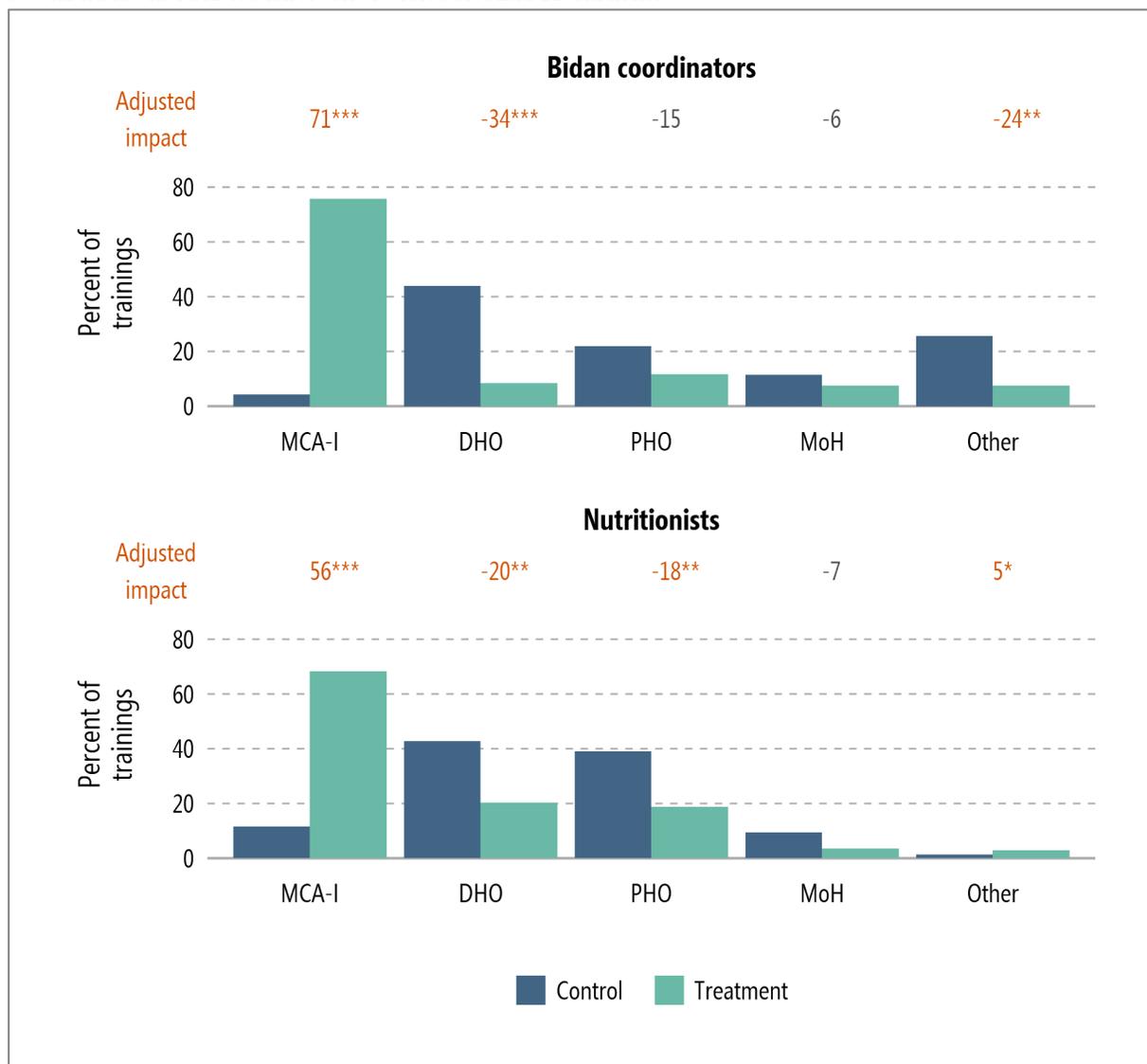
<sup>44</sup> We did not examine the use of the MCA-I manuals for non-MCA-I trainings as a measure of sustainability of the MCA-I manuals based on kabupaten representatives' reports because they reported very few non-MCA-I trainings.

MCA-I training. This was substantially higher than the rates in control areas (by a statistically significant 74 and 56 percentage points, respectively).

At the training level, bidan coordinators and nutritionists in treatment areas reported that about three-quarters and two-thirds of all growth monitoring trainings conducted since 2014 were funded by MCA-I, respectively (Figure 7.15). This was substantially higher than the proportions in control areas, which were about one-tenth or less; in control areas, the DHO, PHO, and other sources (for bidan coordinator trainings) were the most important funding sources, and were significantly more common than in treatment areas.

Overall, these findings suggest that MCA-I played an important role in funding growth monitoring trainings in the treatment areas since 2014. However, trainings in control areas funded by other sources—especially trainings conducted more recently—limited the treatment-control gap in training participation at endline.

**FIGURE 7.15 FUNDING SOURCES FOR GROWTH MONITORING TRAININGS, AS REPORTED BY BIDAN COORDINATORS AND NUTRITIONISTS WHO ATTENDED TRAININGS**



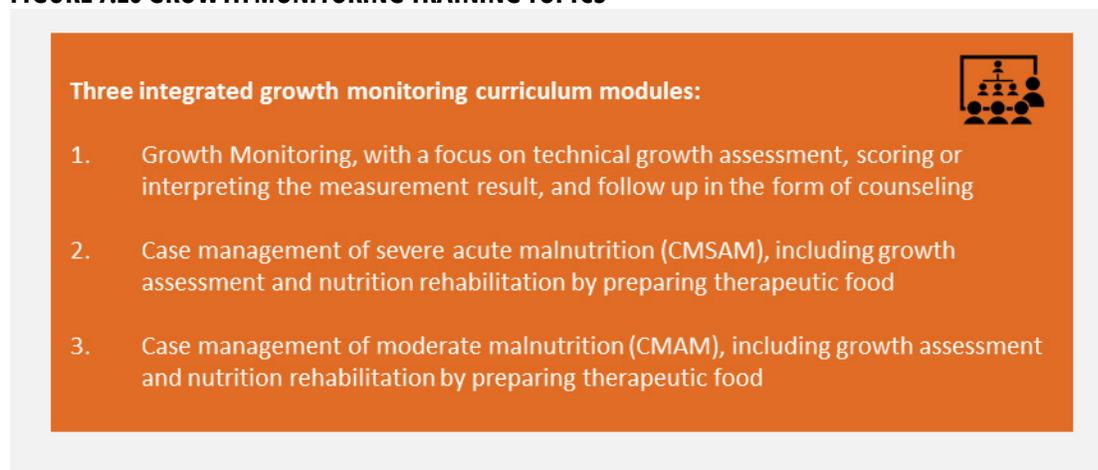
Source: Bidan coordinator and nutritionist endline surveys

Sample size: 72 trainings attended by bidan coordinators and 152 trainings attended by nutritionists

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

### *Training content*

The content of the growth monitoring training could affect providers' ability to conduct growth monitoring, interpret the results, and communicate them to caregivers. We therefore asked providers what topics were covered in the trainings. (Figure 7.16 shows the topics that were supposed to be covered in IYCF trainings, based on the training materials.)

**FIGURE 7.16 GROWTH MONITORING TRAINING TOPICS**

**The growth trainings conducted in treatment areas covered a much wider range of topics than those conducted in control areas.** All growth monitoring topics that we asked about were more likely to be covered in trainings in treatment areas compared to those in control areas (Figure 7.17). The magnitude and statistical significance of the treatment-control differences varies across topics and providers, but for many topics it was between 10 and 50 percentage points and statistically significant. Topics with statistically significant positive impacts include using the *Buku Grafik Pertumbuhan Anak* (GPA) growth monitoring book also called the KMS, the reasons for growth monitoring, maintenance of measuring instruments, and calculating body mass index.

Trainings in treatment areas were also substantially more likely than those in control areas to explicitly cover stunting-related topics, namely how to identify stunted children and how to treat them. For bidan coordinators, the differences for these topics were a statistically significant 42 and 51 percentage points, respectively, and for nutritionists they were a statistically significant 26 and 23 percentage points, respectively. These impacts are consistent with the new stunting-focused modules added to the training materials by MCA-I. In qualitative responses, several kabupaten representatives also emphasized that MCA-I trainings were more comprehensive and detailed relative to other growth monitoring trainings—for example, in terms of how to conduct anthropometric measurements, and by explicitly including stunting as a topic.

**FIGURE 7.17 TOPICS COVERED IN GROWTH MONITORING TRAININGS, AS REPORTED BY BIDAN COORDINATORS AND NUTRITIONISTS WHO ATTENDED TRAININGS**



Source: Bidan coordinator and nutritionist endline surveys

Sample size: 74 trainings attended by bidan coordinators and 155 trainings attended by nutritionists

Note: Marasmus and kwashiorkor are forms of severe malnutrition in children.

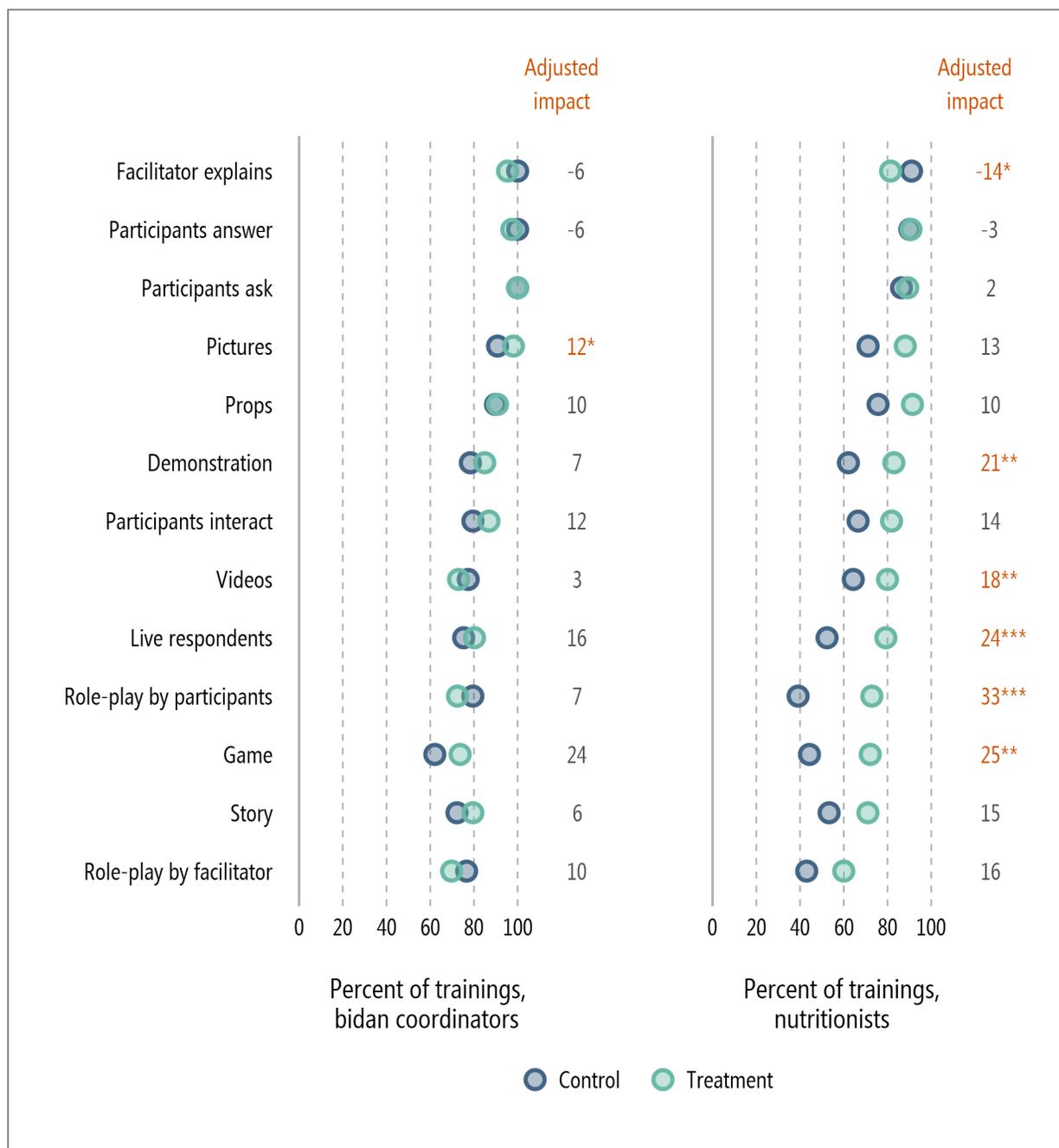
\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

### Teaching methods

Similar to the IYCF trainings, MCA-I not only modified the MoH training content but also intended that their training would employ more innovative teaching methods to ensure that participants absorbed the material and could apply what they learned. Here we examine the teaching methods used in treatment and control areas.

**Non-traditional training methods such as videos, games, and interactive methods were more common in treatment areas, according to nutritionists.** According to nutritionists, the most common teaching methods used in growth monitoring trainings in the control group were traditional methods, such as facilitators giving explanations, asking questions, and taking questions from participants. In contrast, trainings in the treatment group were less likely to involve facilitators simply giving explanations (by a marginally statistically significant 14 percentage points), and were more likely to involve non-traditional methods (Figure 7.18). Specifically, methods such as videos, games, role-playing by training participants, practicing with “live” participants, and facilitators providing a demonstration were substantially more common in the treatment group; the treatment-control differences for these specific methods were statistically significant and between about 15 and 35 percentage points. The treatment-control differences for non-traditional methods were generally positive for bidan coordinators too, but were smaller than for nutritionists and not statistically significant because of the small sample size of trainings.

**FIGURE 7.18 TEACHING METHODS USED AT GROWTH MONITORING TRAININGS, AS REPORTED BY BIDAN COORDINATORS AND NUTRITIONISTS WHO ATTENDED TRAINING**



Source: Bidan coordinator and nutritionist endline surveys

Sample size: 74 trainings attended by bidan coordinators and 155 trainings attended by nutritionists

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

### 7.3 Knowledge

The most proximal outcome of the training is that providers learned the training content. To understand this first step in training efficacy, we asked providers a range of simple questions about key IYCF training topics, as well as stunting (which was covered briefly in the IYCF trainings and was central to the growth monitoring trainings).<sup>45</sup> We also examined awareness of stunting among desa administrators and caregivers. This could have been affected by IYCF trainings, Generasi (because Generasi facilitators had a module on stunting), CLTS trainings (which included messages about stunting), and the communications campaign (in treatment and control areas). Detailed results are in Appendix B Tables 7.28–7.33.

**The Project had very limited impacts on providers’ and caregivers’ basic knowledge of breastfeeding topics, which was already high before the IYCF training.** We asked providers and caregivers some basic questions about IYCF topics, including several aspects of breastfeeding (Figure 7.19).<sup>46</sup> These included when a baby should first be given breastmilk (as soon as possible after birth), when a baby should first be given liquids other than breastmilk (after age 6 months), the appropriate frequency of breastfeeding until age 6 months (8–12 times per day), and how long breastfeeding should continue (at least until age 2 years). Knowledge of these topics was generally high among providers, except for the correct frequency of breastfeeding. Across providers, the differences between treatment and control groups in the proportion of providers correctly answering the questions were small (less than 10 percentage points), although a handful of differences were statistically significant. For caregivers, knowledge was slightly lower than among providers, but again the treatment-control differences were small (Figure 7.20).

These findings suggests that, despite the positive impacts on provider participation in IYCF trainings discussed earlier, impacts on providers’ and caregivers’ knowledge about these basic topics was limited. It is possible that this question was not difficult or comprehensive enough to adequately assess what training participants learned given that knowledge levels for these questions were overall high.

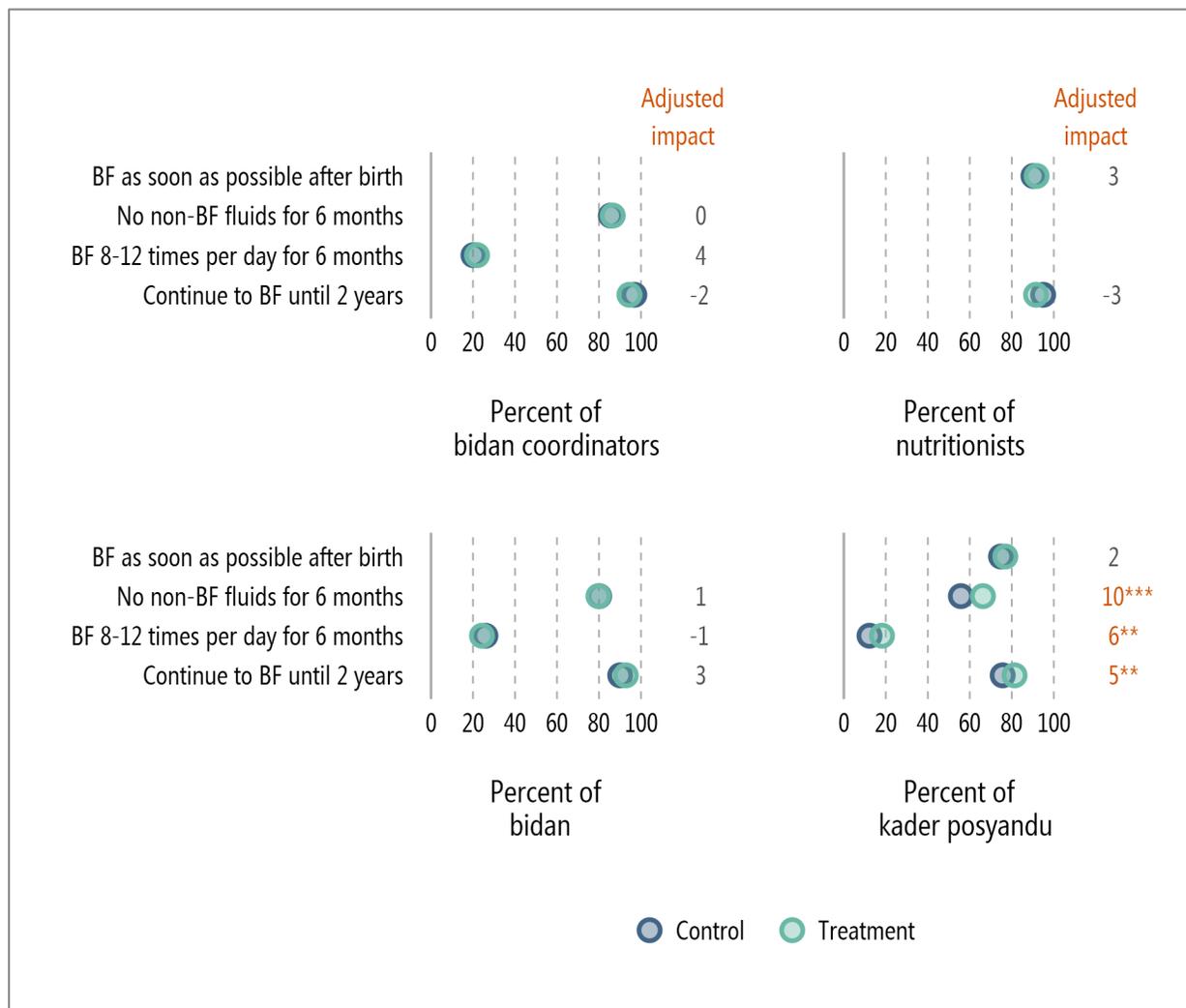
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<sup>45</sup> At baseline, we constructed basic knowledge questions based on the IYCF and growth monitoring training manuals. We repeated a subset of these questions at endline. We chose the endline questions based on baseline and interim rates of correct response; generally, we excluded questions that were correctly answered by 90 percent or more of respondents in previous rounds.

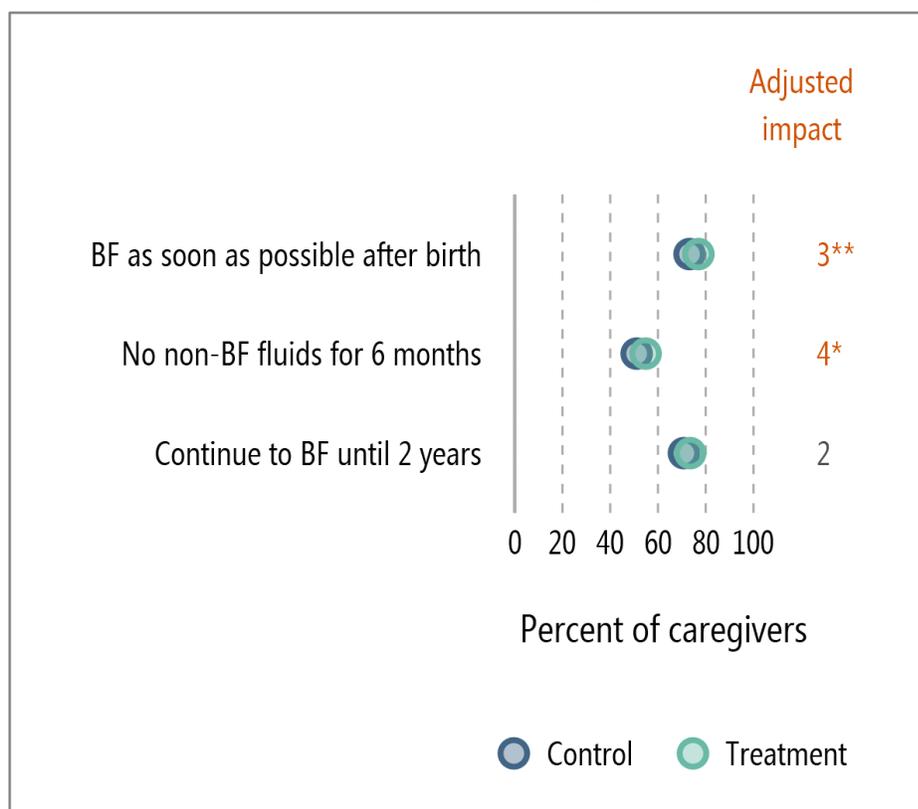
<sup>46</sup> At baseline, knowledge of some topics was very high (more than 90 percent) among certain types of respondents. Given the limited scope for improvement in knowledge of these topics, we omitted them for the relevant respondents. As a result, the topics included in Figure 7.19 vary across respondents.

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**FIGURE 7.19 KNOWLEDGE OF BREASTFEEDING TOPICS, AS REPORTED BY BIDAN COORDINATORS, NUTRITIONISTS, BIDAN, AND KADER POSYANDU**



Source: Bidan coordinator, nutritionist, bidan, and kader posyandu endline surveys  
 Sample size: 232–235 bidan coordinators, 242 nutritionists, 778 bidan, and 1928–1960 kader posyandu  
 \* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**FIGURE 7.20 KNOWLEDGE OF BREASTFEEDING TOPICS, AS REPORTED BY CAREGIVERS**

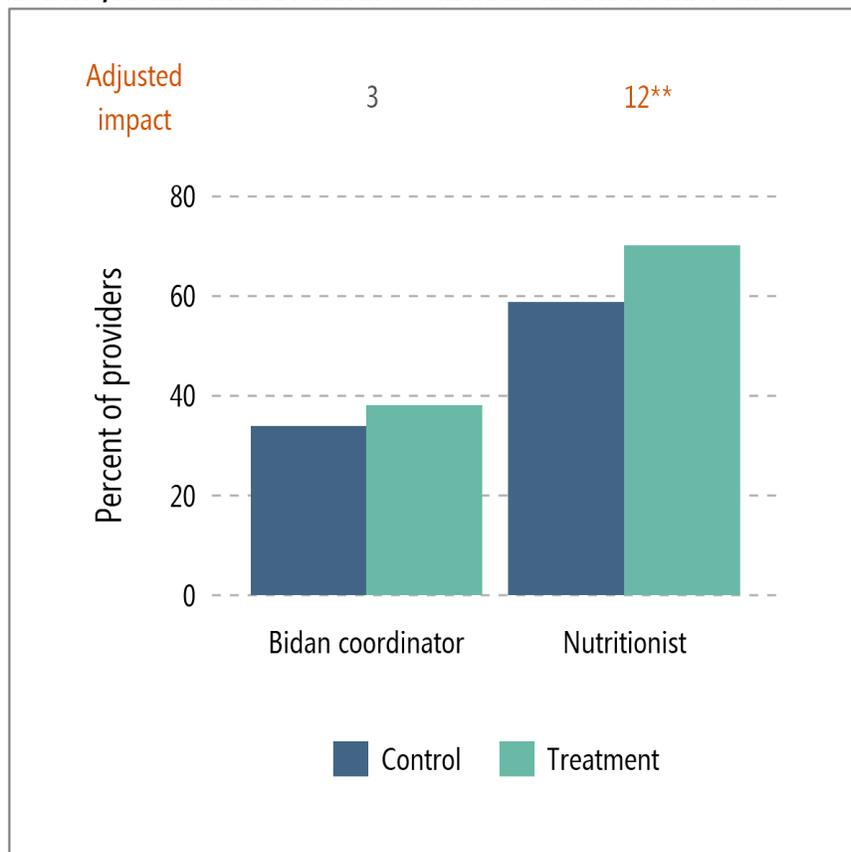
Source: Caregiver endline surveys

Sample size: 9,120 caregivers

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**Many providers were unaware of a basic aspect of child length measurement.** Only about 4 in 10 bidan coordinators in treatment areas knew that a child's length should be measured lying down until age 24 months. Even among nutritionists in treatment areas, who were the main target audience for growth monitoring trainings, only 7 in 10 knew this (Figure 7.21). For nutritionists, knowledge about this topic was slightly higher than in control areas, by a modest but statistically significant 12 percentage points; there was no significant difference for bidan coordinators. Thus, many providers might be measuring child length using the incorrect technique for their age, which can result in inaccurate measurements, and the Project only modestly improved this.

**FIGURE 7.21 KNOWLEDGE THAT CHILDREN SHOULD BE MEASURED FOR LENGTH LYING DOWN UNTIL AGE 24 MONTHS, AS REPORTED BY BIDAN COORDINATORS AND NUTRITIONISTS**



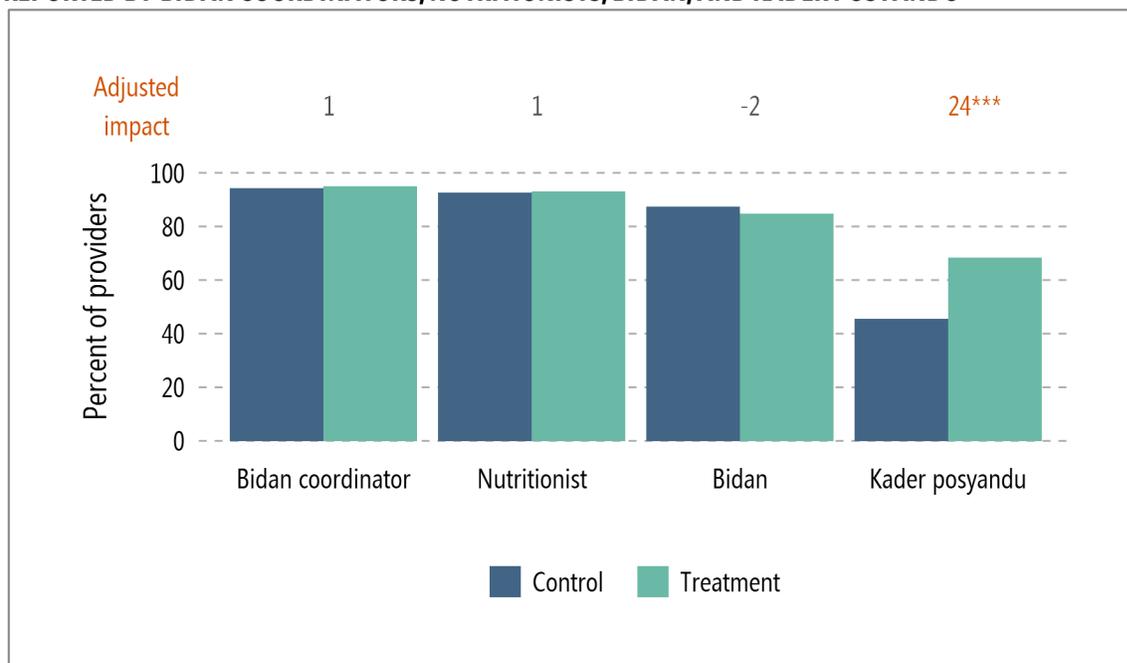
Source: Bidan coordinator and nutritionist endline surveys

Sample size: 242 bidan coordinators and 242 nutritionists

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**The Project substantially improved knowledge about the adverse effects of stunting among kader posyandu and modestly improved awareness of stunting among desa administrators and caregivers.** More than 90 percent of bidan coordinators and nutritionists in the treatment group and 85 percent of bidan knew that stunting adversely affects both physical and mental development (Figure 7.22). Knowledge about this topic was similarly high for providers in control areas. In contrast, about 68 percent of kader posyandu in treatment areas knew about this, a statistically significant 24 percentage points higher than in control areas. Thus, the Project improved knowledge about the adverse effects of stunting for the type of provider for which it was lowest at baseline.

**FIGURE 7.22 KNOWLEDGE THAT STUNTING ADVERSELY AFFECTS PHYSICAL AND MENTAL DEVELOPMENT, AS REPORTED BY BIDAN COORDINATORS, NUTRITIONISTS, BIDAN, AND KADER POSYANDU**



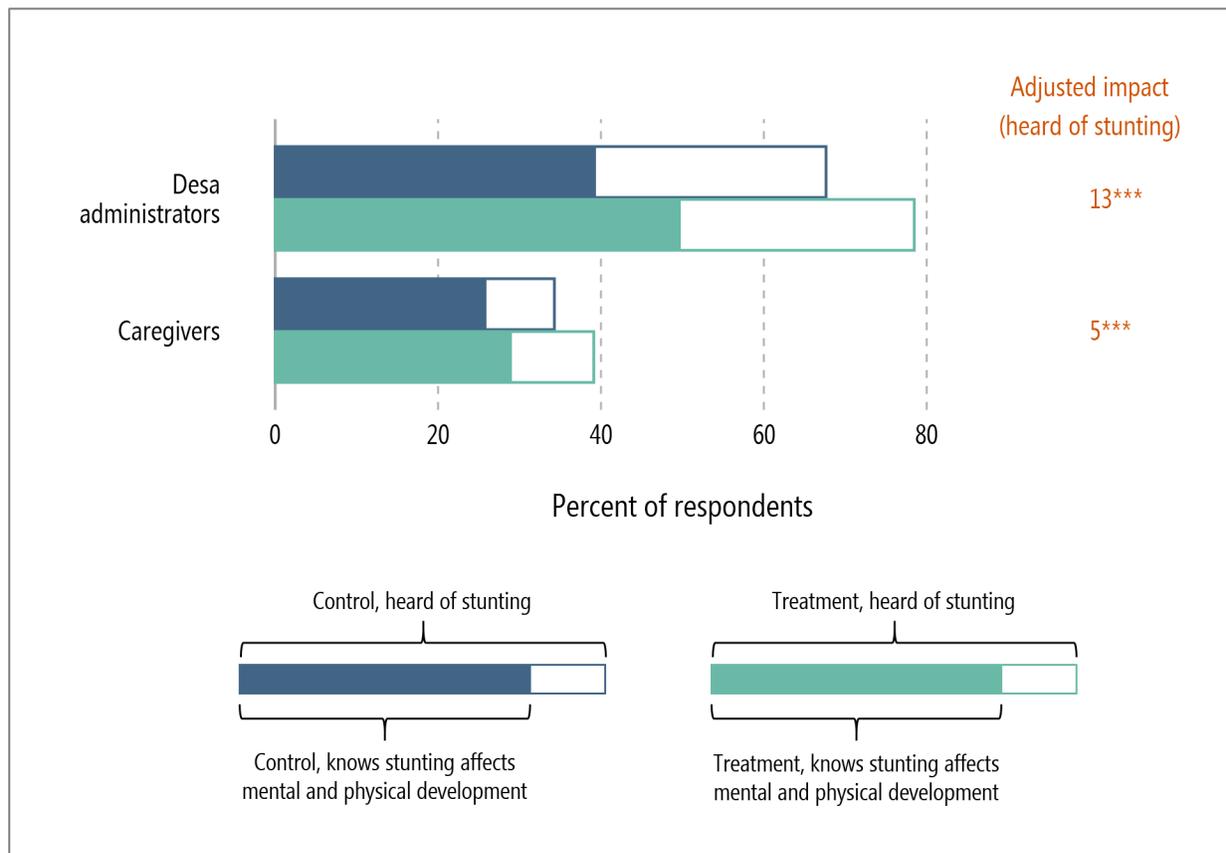
Source: Bidan coordinator, nutritionist, bidan, and kader posyandu endline surveys

Sample size: 242 bidan coordinators, 242 nutritionists, 778 bidan, and 1,960 kader posyandu

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

We also examined awareness of stunting and its adverse effects among desa administrators and caregivers. Almost 80 percent of desa administrators in treatment areas had heard of a condition called stunting, a statistically significant 13 percentage points more than in control areas (Figure 7.23). Only 39 percent of caregivers in the treatment group had heard of stunting, a small but statistically significant 5 percentage points higher than in the control group. Among both desa administrators and caregivers who had heard of stunting, the proportion that were aware that stunting adversely affects both physical and mental development was similar in the treatment and control groups. Thus, the Project modestly affected awareness of stunting but not more detailed knowledge about its adverse effects.

**FIGURE 7.23 AWARENESS OF STUNTING AND ITS ADVERSE EFFECTS, AS REPORTED BY DESA ADMINISTRATORS AND CAREGIVERS**



Source: Desa administrator and caregiver endline surveys

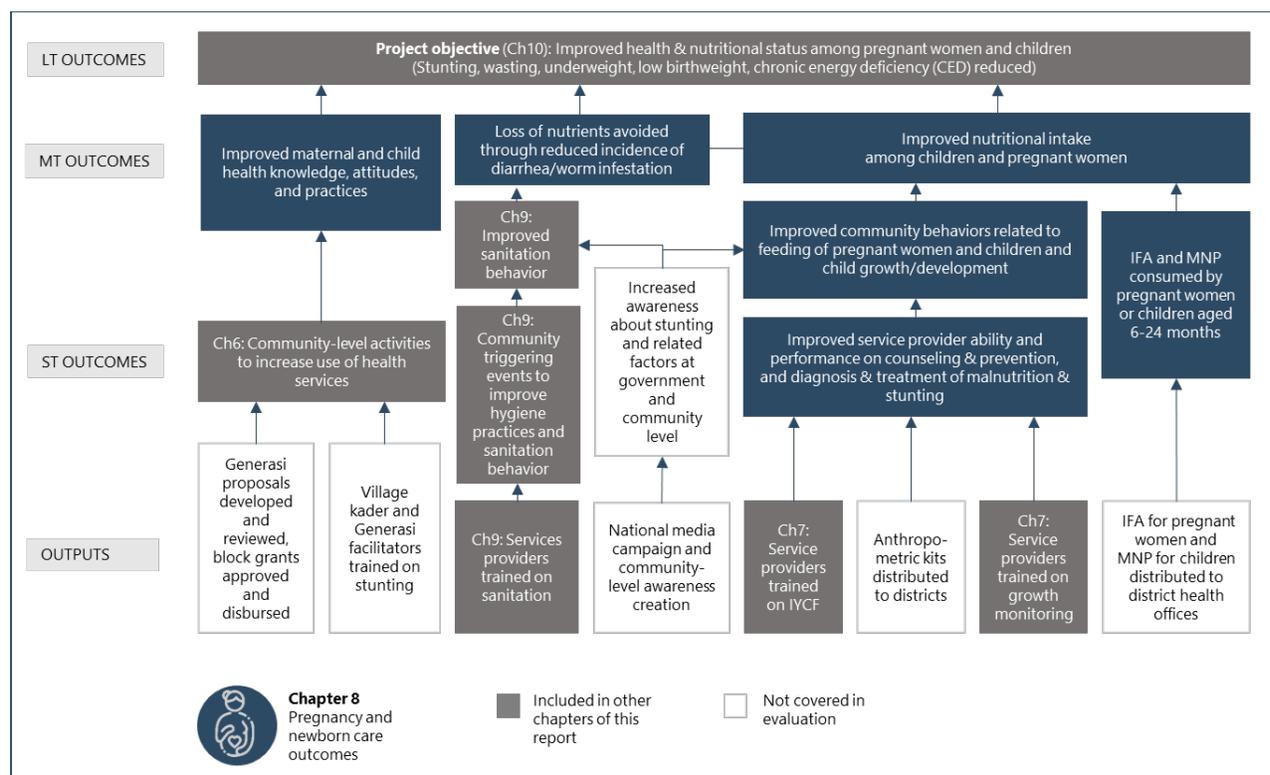
Sample size: 1,158 desa administrators and 9,120 caregivers

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

## 8. MATERNAL AND CHILD HEALTH OUTCOMES

The Nutrition Project was designed to achieve its key long-term outcome—improved child health and nutritional status—through a set of interventions that targeted the 1,000 days from conception until age 2, a critical period for children’s growth and brain development (Karakochuk et al. 2017). These interventions were expected to improve a broad range of medium-term maternal and child health outcomes over this period. This chapter presents findings for nearly all medium-term outcomes across the Nutrition Project, shown in dark blue in Figure 8.1.

**FIGURE 8.1 LOGIC MODEL WITH LINKS TO THE OUTCOMES IN THIS CHAPTER**



Specifically, this chapter covers outcomes related to prenatal care, delivery, postnatal care, immunizations, child nutrition, and child diarrhea and worms (Figure 8.2 summarizes the Project impacts on key outcomes in these domains). Medium-term outcomes related to sanitation are found in Chapter 9; long-term outcomes of improved health and nutritional status follow in Chapter 10.

FIGURE 8.2 SUMMARY OF PROJECT IMPACT ON MATERNAL AND CHILD HEALTH OUTCOMES



Outcome	Impact summary
 Prenatal checkups	→
 IFA pills consumption	↗
 Deliveries assisted by a skilled provider or conducted at a facility	→ despite large increase between baseline and endline
 Receipt of postnatal checkups for mothers or babies	→
 Full set of immunizations for children	→
 Vitamin A intake for children	→
Posyandu holding nutritional group counseling	↗
 Participation in nutritional group counseling (mothers)	↗ but small and overall participation rates remained low
Exclusive breastfeeding until age 6 months	↗ but less than half of mothers exclusively breastfed although almost all breastfed
Complementary feeding for children over 6 months	↗ frequency of eating solid food
	→ dietary diversity
 Monthly weight checks	→
Length check in the last year	↗ for children over 12 months
Incidence of diarrhea	→

 Similar to a Generasi indicator    → No impact    █ Positive impact

## 8.1 Prenatal care

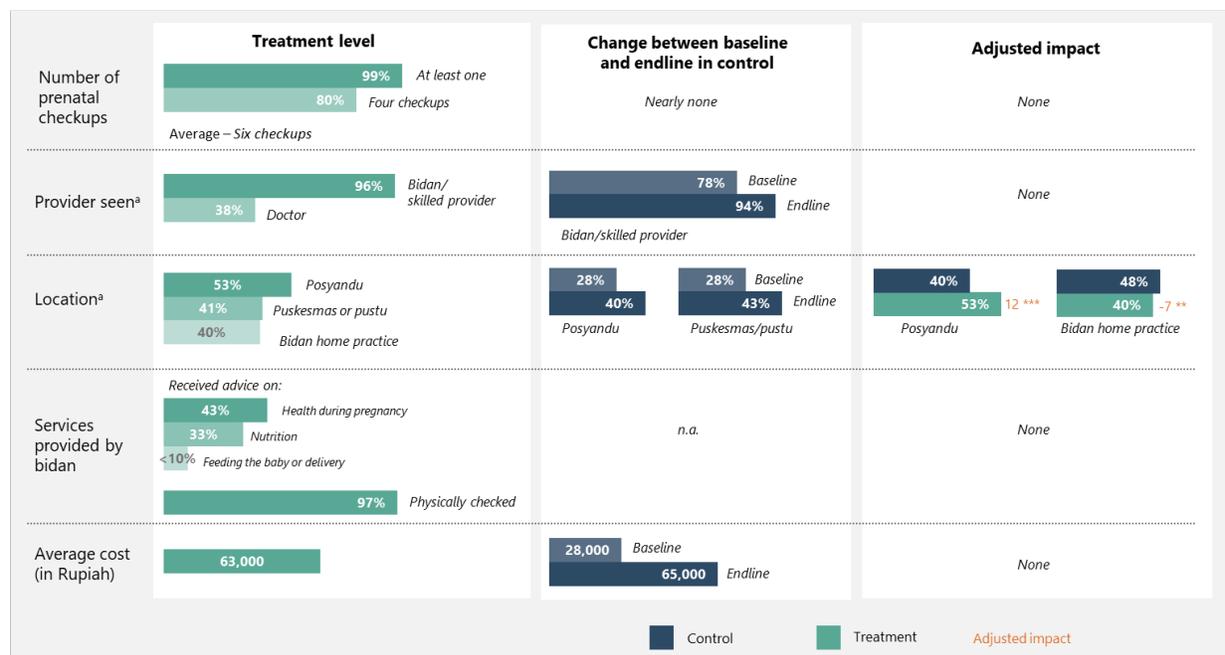
Because the critical 1,000 day period described above starts at conception, high-quality prenatal care—which includes frequent checkups by skilled providers and adequate consumption of IFA, the two Generasi indicators related to prenatal care—is essential in establishing a strong foundation for child health. In this section, we assess the Project’s impacts on prenatal checkups and IFA consumption.

### 8.1.1 Prenatal checkups

The Project was expected to increase the proportion of pregnant women who received adequate prenatal checkups, through several mechanisms. First, one of the Generasi indicators—the percent of pregnant women who received at least four prenatal checkups—provided a direct incentive to the community to ensure that pregnant women achieved this goal. Second, related to

the indicator, communities could use Generasi funds to connect skilled providers and pregnant women; for example, Generasi funds could be used for transporting providers or pregnant women for prenatal checkups (PNPM PKK Central Coordination Team 2011). Third, the IYCF training was intended to improve the quality of prenatal checkups because providers would receive information and guidance on how to perform checkups and interact with pregnant women. We summarize various aspects of prenatal checkup results in Figure 8.3 below. Detailed results are in Appendix B, Tables 8.1–8.6.

**FIGURE 8.3 RESULTS ON PRENATAL CHECKUPS, AS REPORTED BY MOTHERS OF 0–35 MONTH OLDS**



Source: Caregiver baseline and endline surveys

Sample size: 5,901 caregivers

<sup>a</sup>For providers and locations totals can exceed 100 percent because we allowed for multiple answers.

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

n.a = not applicable because not measured at baseline

### Most mothers met the Generasi target of four prenatal checkups, but this target was met equally across treatment and control groups and was almost unchanged from baseline.

Nearly all mothers of 0–35 month old children in the treatment group (99 percent) received at least one prenatal checkup, and 80 percent met the Generasi target of at least four checkups, according to information in their buku KIA (Figure 8.4 shows the distribution of prenatal checkups).<sup>47</sup> On average, mothers who received prenatal checkups received six checkups during

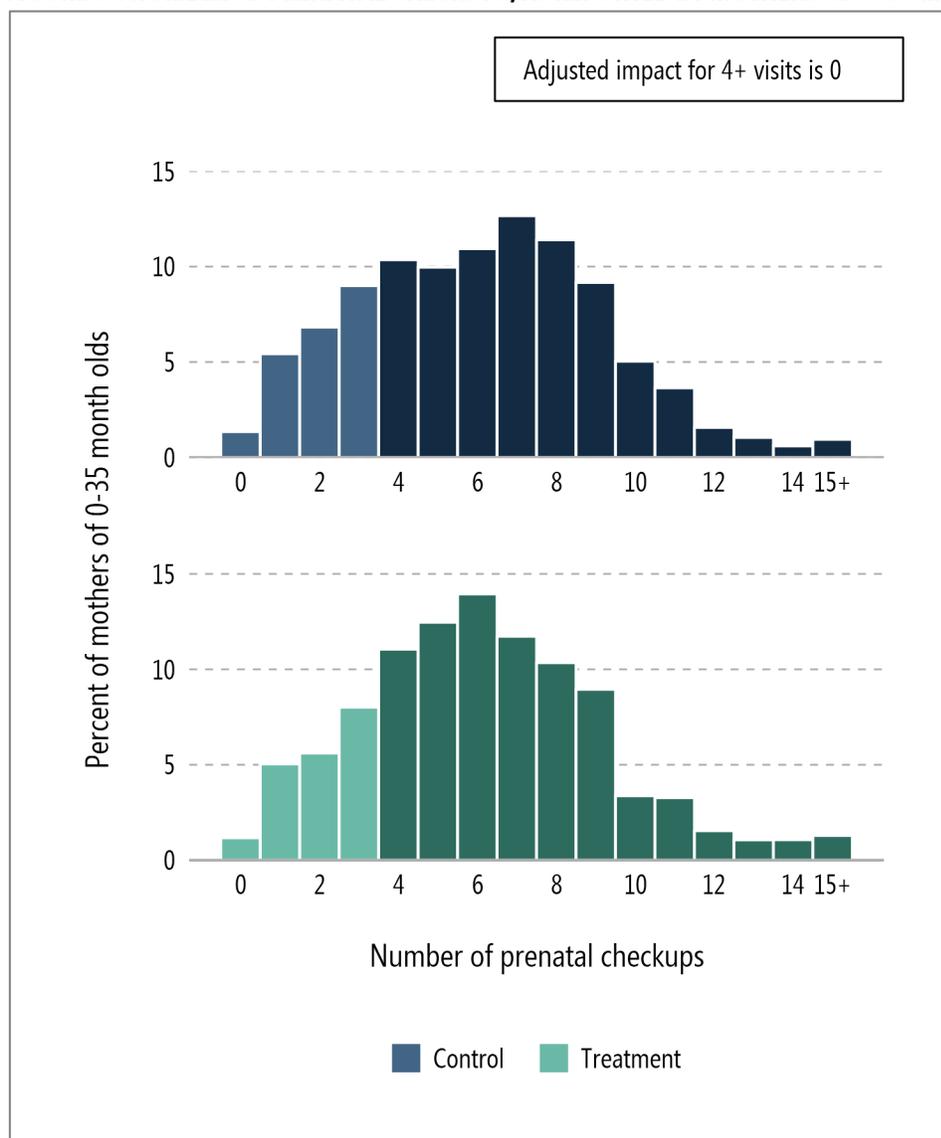
<sup>47</sup> To limit recall bias, our estimates of prenatal checkups for the full sample of mothers of 0–35 month old children are based on information recorded in the mother’s buku KIA. Seventy-seven percent of mothers in the treatment group had a buku KIA, a statistically significant 7 percentage points higher than in the control group. The relatively modest treatment-control difference in the prevalence of buku KIA suggests that the impacts on prenatal checkups (and other outcomes drawn from the buku KIA) are unlikely to be driven by selection bias (that is,

their pregnancy. These measures were similar in the control group, suggesting that they were not impacted by the Project, and were very similar to the baseline levels. Subgroup analysis reveals that there was a statistically significant impact of 6 percentage points on receipt of the recommended four prenatal checkups for mothers in more remote areas (defined as living in a desa located more than a 30 minute one-way trip from the puskesmas), even though the impact for the full sample was not statistically significant.

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different types of mothers having buku KIA in the treatment and control groups). As a robustness check, we also estimated prenatal checkups for mothers of 0–11 month old children—for whom recall bias should be less severe—using information from self-reports when it was not available in the buku KIA. The results were very similar to those for the full sample using buku KIA only.

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**FIGURE 8.4 NUMBER OF PRENATAL CHECKUPS, AS REPORTED BY MOTHERS OF 0–35 MONTH OLDS**

Source: Caregiver baseline and endline surveys

Sample size: 5,901 caregivers

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

We also asked mothers of 0–11 month children which provider(s) they saw for prenatal care.<sup>48</sup> Nearly all of these mothers saw a skilled provider (most commonly a bidan or doctor) for a checkup at least once in their pregnancy. Specifically, almost all mothers (96 percent) saw a bidan, and about 38 percent saw a doctor at some point in their pregnancy; less than one percent

<sup>48</sup> The provider and location of checkups were not recorded in buku KIA and are based on self-reports. To limit recall bias, we only captured this information from mothers of 0–11 month old children.

saw a traditional birth attendant or kader posyandu (unskilled providers) as their only provider.<sup>49</sup> There was no difference between the treatment and control groups for any of these measures, suggesting that the Project did not affect the frequency of prenatal checkups nor who provided them.

**However, the Project affected the location of prenatal checkups—it encouraged more pregnant women to seek prenatal care at the posyandu.** At endline, 53 percent of mothers of 0–11 month old children in the treatment group reported receiving prenatal checkups at the posyandu, a statistically significant 13 percentage points higher than those in the control group. (This does not necessarily imply that mothers were more likely to receive prenatal checkups from kader posyandu, who are relatively unskilled providers; less than 5 percent of mothers in both the treatment or control groups reported seeing a kader posyandu for prenatal checkups). Mothers in the treatment group were also less likely to receive checkups at the doctor’s or bidan’s home practice than those in the control group, by a statistically significant 6 percentage points (Figure 8.5). Other locations for prenatal checkups were reported to a similar extent by mothers in the treatment and control groups.

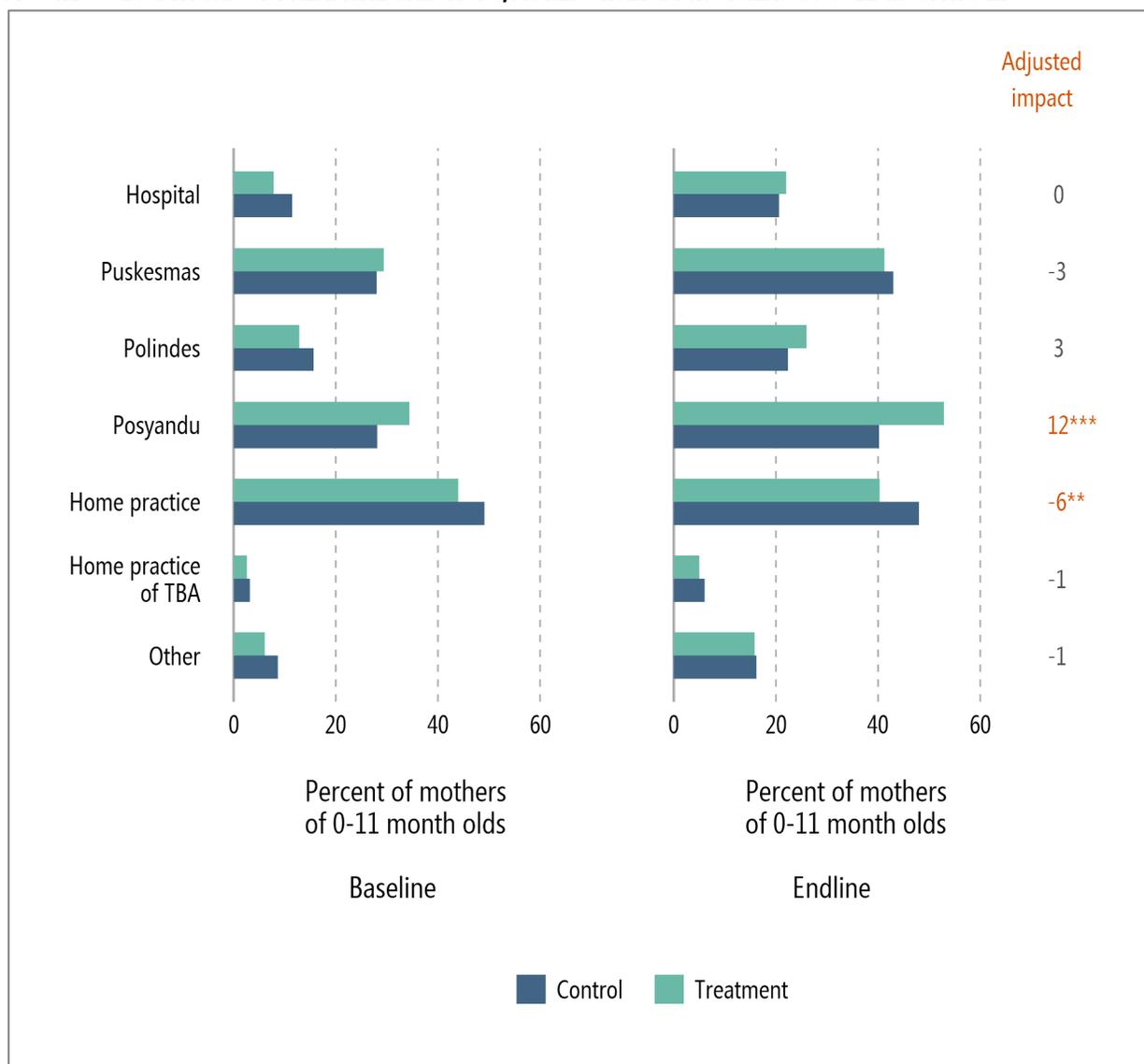
The increased use of the posyandu as a venue for prenatal checkups is aligned with the Project’s efforts to support the posyandu as a center point of care for maternal and child health. Although the Project had no effect on the prenatal care provider, more checkups at the posyandu could translate into greater convenience for expectant mothers because, as we showed in Chapter 5, posyandu are typically held close to where households live.

The higher likelihood of prenatal checkups at the posyandu in the treatment group is not because these posyandu were more likely to offer these checkups than those in the control group. Specifically, at endline about 8 in 10 kader posyandu in both the treatment and control groups reported that their posyandu offered prenatal checkups in the last 12 months. Rather the higher likelihood of prenatal checkups at the posyandu could be because Generasi made it easier for mothers to access a range of services at the posyandu, including prenatal checkups, since Generasi encouraged posyandu attendance.

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<sup>49</sup> Because we did not capture information about each prenatal checkup, we are unable to report the percentage of mothers who received *all* their prenatal checkups from skilled providers.

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**FIGURE 8.5 LOCATIONS OF PRENATAL CHECKUPS, AS REPORTED BY MOTHERS OF 0–11 MONTH OLDS**

Source: Caregiver baseline and endline surveys

Sample size: 960 caregivers (baseline), 2,953 caregivers (endline)

Note: TBA=Traditional birth attendant

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

### 8.1.2 IFA and other micronutrients

Iron is a critical micronutrient supplement during pregnancy because maternal anemia, especially in the first trimester, can lead to low birthweight (less than 2500g), which is associated with higher neonatal mortality, impaired language and brain development, and increased risk of chronic diseases including cardiovascular disease and diabetes (Katz et al. 2013; Luyckx et al. 2005; Norris et al. 2012; Shoboo et al. 2017; Zerbeto 2015; Beard 2008). Anemia is indeed a serious problem in the kabupaten targeted by the Project—at baseline, 61 percent of children

ages 6–35 months and 55 percent of pregnant women across the treatment and control areas were anemic (hemoglobin level of less than 11 g/dL) (Null et. al 2016). In addition, folic acid supplementation has been shown to decrease the incidence of neural tube disorders, an important cause of stillbirths, neonatal death, and severe disability (Blencowe et al. 2010). A review of the 2002–07 Indonesia Demographic and Health Surveys concluded that the risk of neonatal death was lower for women who took IFA supplements during pregnancy (Titaley and Dibley 2012).

The Project sought to encourage greater IFA consumption in four ways:

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**1. Supporting a new formulation with fewer side effects.** MCA-I supported implementation of a 2014 MoH regulation that called for all IFA to be formulated according to WHO guidelines by 2016. In Project areas, MCA-I was responsible for identifying a firm that manufactured pills that followed these guidelines and for improving IFA quality control with activities such as subjecting the IFA to greater inspection at the production, storage, and distribution levels (Abt 2018). Pills were to include 60 mg of ferrous fumarate and 0.4 mg of folic acid, a formulation designed to reduce side effects compared to the previous MoH formulation, and be sugar-coated or film-coated with vanilla flavoring, making them easier to consume. In Project areas, this IFA was called Camabion; outside of Project intervention areas, three other Indonesian pharmaceutical companies (Kimia Farma, Phapros, and Indofarma) manufactured new pills in compliance with the new regulation during the same period and their pills bore their company names (Abt 2018).
- 

**2. Improving distribution.** MCA-I took over the MoH’s role in distributing IFA during the Compact, hoping to improve distribution. (The Project areas were already receiving IFA before the Project; the MCC-funded IFA largely substituted for the MoH’s existing IFA distribution.) The MCC-funded IFA was distributed to DHOs through January 2018; the DHOs distributed to puskesmas, which gave IFA directly to clients and to bidan who distributed it to their clients. Most pregnant women would have received MCC-funded IFA between September 2017 and September 2018. This delay meant that it was unlikely that the IFA funded by MCC would still be distributed and consumed in treatment desa by the time of the endline (between January and April 2019). However, we would expect impacts on IFA receipt and consumption to materialize for mothers of 0–11 month old children at endline, because a large fraction of these mothers would have been pregnant during the period when the IFA funded by MCC would have been distributed.
- 

**3. Generasi funding.** The Generasi indicator—proportion of women who received 90 pills during pregnancy—sought to incentivize communities to improve IFA receipt and in turn consumption. Communities could also use Generasi funds for transporting providers to see patients or to transport women for checkups where they could receive IFA, or for transporting IFA to the posyandu (PNPM PKK Central Coordination Team 2011).
- 

**4. Encouraging health providers to promote IFA.** The IYCF training supported by MCA-I for bidan coordinators, nutritionists, bidan, and kader posyandu included information on the importance of IFA in preventing anemia, the appropriate dosage

throughout pregnancy, how to encourage women to take it despite side effects, and how to forecast the need for and procure IFA. The Project supplied providers and in turn women with “compliance cards” that allowed women to keep track of when they took IFA. Bidan collected these cards and the IFA packaging to prove women’s consumption and sent cards to the puskesmas as part of Project monitoring (Abt 2018).

Below, we examine the Project’s impacts on IFA receipt and consumption. Detailed results are in Appendix B, Tables 8.7–8.13.<sup>50</sup>

**The Project had a positive impact on IFA receipt, but only about one-third of mothers in the treatment group received the recommended number of pills.** At endline, the vast majority of mothers in the treatment group (88 percent) reported receiving at least some IFA pills during pregnancy, which was a statistically significant 5 percentage points higher than in control areas. Among mothers who received IFA pills, the average number of pills received was higher in treatment areas by a statistically significant 18 pills, although the treatment average was slightly below the recommended 90 pills (85 pills). Consistent with the higher average number of pills received, mothers in the treatment group were a statistically significant 10 percentage points more likely to receive the recommended 90 pills compared to those in the control group; however, only about 34 percent of mothers in the treatment group received this recommended number.

**The Project also had a positive impact on IFA consumption, but less than a quarter of mothers in the treatment group consumed the recommended number of pills.** At endline, mothers in treatment areas were a statistically significant 9 percentage points more likely to consume the recommended 90 pills than those in control areas. Consistent with the low percentage of women receiving the recommended 90 IFA pills, consumption of the recommended number was also low; at endline, only 23 percent of mothers in the treatment group consumed at least 90 IFA pills. Subgroup analysis suggests that the impacts on consumption of 90 IFA pills were larger and statistically significant for mothers in the lower socio-economic quintiles compared to those in higher quintiles.

Figure 8.6 shows the relationship between receipt and consumption of IFA pills for mothers of 0–11 month old children. As discussed above, the vast majority of mothers in the treatment group received at least some IFA pills at endline; this was a small improvement from baseline, but was similar to the control group. However, less than half of these mothers received the recommended 90 pills, and only about two-thirds of mothers who received 90 pills consumed the recommended amount. Both receipt and consumption of the recommended 90 pills was similar to baseline in the control group, but increased for the treatment group due to the impacts of the

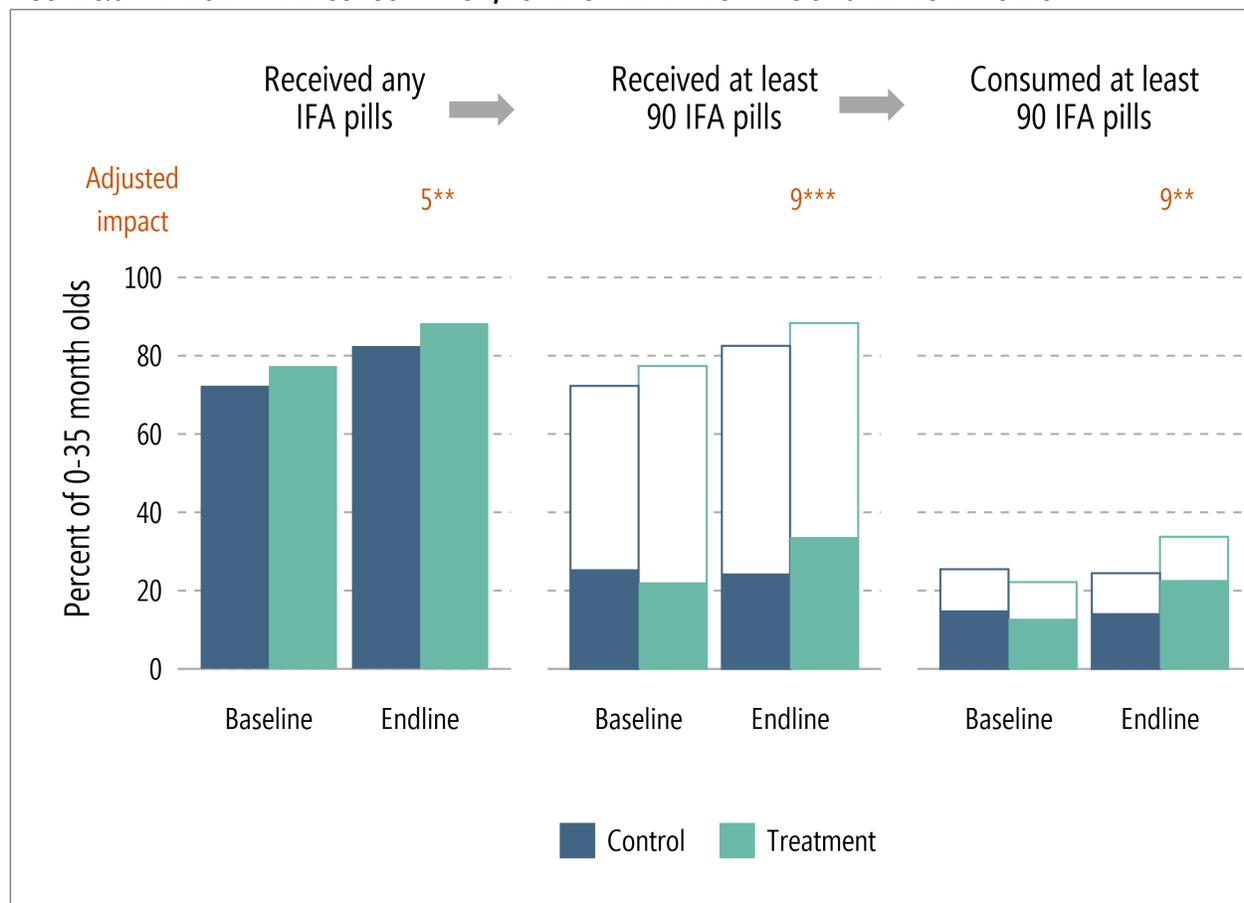
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<sup>50</sup> Because of the potential for recall error about IFA receipt and consumption during pregnancy, all caregiver-level results related to IFA are from surveys with mothers of 0–11 month olds. As a robustness check, we also conducted the IFA-related analysis with a sample restriction to mothers of 0–5 month olds, for whom recall might be even better. The results were similar to those for mothers of 0–11 month olds, although the statistical significance of some results is lower with the sample restriction because of a smaller sample size.

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Project. However, taken together, only about one-quarter of all mothers in the treatment group consumed the recommended number of IFA pills at endline, as mentioned above.

**FIGURE 8.6 IFA RECEIPT AND CONSUMPTION, AS REPORTED BY MOTHERS OF 0–11 MONTH OLDS**



Source: Caregiver baseline and endline surveys

Sample size: 1,046 caregivers (baseline), 3,041 caregivers (endline)

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

The impacts on IFA consumption were due both to increased receipt of pills and improved compliance with consumption. Specifically, among mothers who received at least 90 pills, the probability of consuming the recommended number of pills was a statistically significant 9 percentage points higher in the treatment group than in the control group. If this measure of compliance with consumption in the treatment group had remained the same as in the control group, the overall impact on consumption of 90 IFA pills (driven by increased receipt of pills alone) would have been about one-third smaller.

**Increased consumption is unlikely to have been driven by decreased side effects due to the improved formulation.** There are two reasons for this assertion. First, nearly all mothers across treatment and control groups who received IFA received a brand that contained the improved IFA formulation (92 percent and 87 percent, respectively). About 57 percent of mothers in

treatment areas received the IFA brand supported by MCA-I (Camabion), a statistically significant 45 percentage points higher than in control areas, but mothers in control areas were more likely to receive other improved brands. The results were similar based on providers' reports of brands distributed in the three months before the endline survey. For example, bidan in treatment areas were 66 percentage points more likely to distribute Camabion over this period, but bidan in control areas largely distributed other improved brands instead. Results were similar for the period between mid-2017 and mid-2018, which is when we would have expected the Project to have distributed IFA. Second, among mothers who received but did not consume all 90 IFA pills during pregnancy, there was no difference across treatment and control groups in reasons they cited for not consuming all IFA pills, whereas the improved formulation was expected to reduce non-consumption because of side effects. (Side effects and forgetting were the most common causes for non-consumption.)

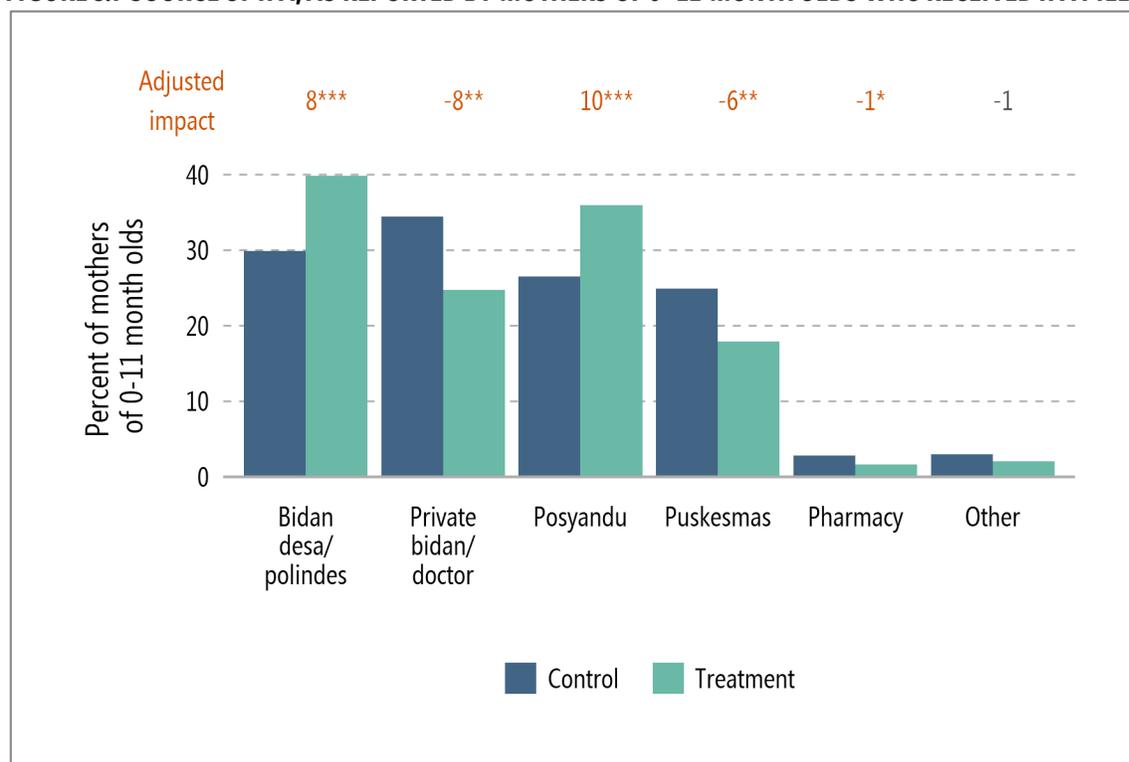
**There is little evidence that increased consumption was due to health provider promotion.**

At endline, more than 90 percent of bidan in both treatment and control areas reported that they had discussed maternal anemia with pregnant woman or caregivers of young children in the six months before the survey. Bidan were slightly more likely to report this in treatment areas, by a statistically significant 4 percentage points. Further, in both treatment and control areas, more than 80 percent of mothers who received pills knew the recommended frequency of consuming them; this was slightly higher in treatment areas, by a statistically significant 6 percentage points. The high levels of these measures in the control group and small estimated impacts suggest that health provider advice to mothers likely made a limited contribution to the improved consumption.

There was no difference in treatment and control groups in terms of bidan reporting providing women IFA in the past three months or the number of pills they provided. This suggests that the increase in receipt of the recommended number of pills—which drove the increase in consumption—were not due to an increase in the promotion of pills by bidan. (Instead, as we show below, the increase in provision of pills mainly occurred at the posyandu.)

**The Project had a small impact on the source of IFA; the bidan desa or polindes, and the posyandu were more common sources in treatment areas.** Mothers in treatment areas who received IFA reported most commonly receiving it from the bidan or at the polindes (40 percent), or at the posyandu (36 percent) (Figure 8.7). These sources were more likely sources than in control areas, by a statistically significant 8 and 10 percentage points, respectively. Compared to control areas, mothers in treatment areas were less likely to receive IFA from a private bidan or doctor, or from the puskesmas, by a statistically significant 8 and 6 percentage points, respectively.

The increased distribution of IFA pills at the posyandu in treatment areas is also consistent with provider reports. Specifically, kader posyandu in treatment areas were a statistically significant 10 percentage points more likely to report that the posyandu provided IFA in the last 12 months than those in control areas. These impacts are consistent with the Project's efforts to encourage providers like bidan and kader posyandu to promote IFA consumption.

**FIGURE 8.7 SOURCE OF IFA, AS REPORTED BY MOTHERS OF 0–11 MONTH OLDS WHO RECEIVED IFA PILLS**

Source: Caregiver baseline and endline surveys

Sample size: 2,602 caregivers

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**Mothers in treatment areas were significantly less likely to report receiving other micronutrients during pregnancy than those in control areas.** Thirty-three percent of mothers in the treatment group reported receiving micronutrients other than IFA during their pregnancy, a statistically significant 9 percentage points lower than in the control group. We do not have an explanation for this difference.

## 8.2 Delivery

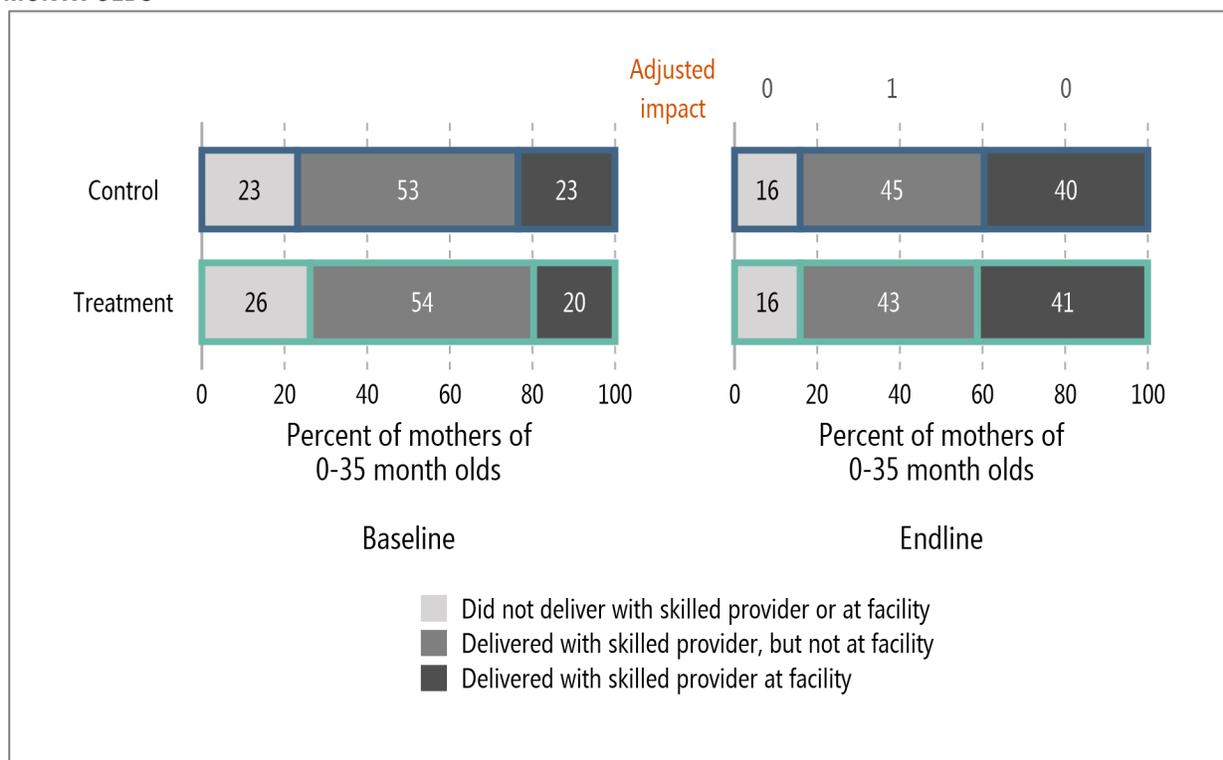
An important factor in preventing infant and maternal mortality is women delivering with the assistance of a skilled provider at an equipped facility (Say et. al 2014; Lawn 2010; WHO 2019).<sup>51</sup> A trained provider has the skills to help prevent the leading causes of maternal death,

<sup>51</sup> Here we define delivery at a facility as delivering at a government or private hospital, the puskesmas, pustu or polindes, or a polyclinic, private clinic, BKIA (maternal and child health facility), or a doctor's private practice. This does not include someone's home, including a bidan's or traditional birth attendant's home or practice, or the posyandu. We define delivery with a skilled provider as with a doctor or medical student, nurse, bidan desa, bidan from the puskesmas or hospital, or private bidan, but not a traditional birth attendant or other acquaintance. We developed these delivery and provider categories based on guidance from WHO 2004 and WHO 2017. (Although "delivery assisted by a trained professional" is a Generasi indicator, we are not aware of a formal Generasi definition of a trained professional/skilled provider.)

such as postpartum hemorrhage, sepsis, obstructed labor, and eclampsia; it is estimated that the presence of a skilled provider at delivery could prevent 16 to 33 percent of all maternal deaths (Graham et al. 2001). Delivery at an equipped facility is preferable to a home birth when possible because home conditions typically lack the equipment needed to handle delivery complications and emergencies that would be present at a health facility (Campbell and Graham 2006).

The Project was expected to increase the percentage of women whose deliveries were assisted by a trained professional through Generasi, as this was a Generasi indicator. Generasi funds could also be used to transport pregnant women to a provider or facility for delivery. Further, the Project was expected to improve quality of deliveries through the IYCF training because the training covered how to carry out deliveries. Detailed results are in Appendix B Table 8.14.

**The percent of deliveries assisted by a trained professional or conducted at a facility improved from baseline, but remained similar in the treatment and control groups.** At endline, 84 percent of mothers in the treatment group received delivery assistance from a trained professional, an approximately 10 percentage point improvement over the baseline (Figure 8.8). About 41 percent of mothers in treatment areas delivered at a facility at endline, double the baseline rate. However, these improvements were similar in the control group, and there was no treatment and control difference at endline, suggesting that the increases since baseline are not attributable to the Project. In terms of supportive supervision for delivery, a minority of bidan coordinators (38 percent in the treatment group) reported assisting or supervising bidan during a regular delivery in the last 30 days, similar to the rate in the control group.

**FIGURE 8.8 SKILLED ATTENDANCE AT DELIVERY AND FACILITY DELIVERY, AS REPORTED BY MOTHERS OF 0–35 MONTH OLDS**

Source: Caregiver baseline and endline surveys

Sample size: 2,995 caregivers (baseline), 9,017 caregivers (endline)

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**Among mothers who delivered at a facility, very few received a subsidy to cover the cost of transport for delivery, and this was similar in the treatment and control groups.** Only 12 percent of mothers in the treatment group and 8 percent in the control group who delivered at a facility received a transport subsidy, a small and not statistically significant difference. The low level in treatment areas is despite the fact that Generasi permitted funds to be used to support delivery transport.<sup>52</sup>

### 8.3 Postnatal care

In this section we examine the Project’s impacts on postnatal care in the weeks immediately after birth, a period of high vulnerability for mothers and their babies. We begin with postnatal care for mothers and then examine postnatal care for babies.<sup>53</sup>

<sup>52</sup> Most mothers report using an ambulance (15 percent), motorbike (35 percent) or car/truck (52 percent) to get to the facility. There is no treatment-control difference in transport modes.

<sup>53</sup> We use the term “postnatal” to refer to all issues pertaining to the mother and baby after birth as per the WHO guide (WHO 2010b).

### 8.3.1 Postnatal care for mothers

The postnatal period is a critical time to monitor the physical and mental health of the mother because most maternal deaths occur during the postnatal period (WHO 2014c). Maternal mortality is extremely high on the first and second days after delivery, but women remain at increased risk of death for up to 42 days postpartum (Ronsmans et al. 2006). Women are also at an increased risk of developing depression during the postpartum period due to a rapid decline in the levels of reproductive hormones after delivery (Wisner et al. 2002). The WHO (2014c) recommends that women be regularly assessed in the first 24 hours and receive at least three additional postnatal appointments: the first on day 3, the second between days 7 and 14, and the third 6 weeks post-delivery. During these appointments, health providers are supposed to assess physical health and healing, breastfeeding progress, and emotional well-being and family/social support.

The Project was expected to increase the percentage of mothers who received three postnatal checkups in the first six weeks after delivery by including this as a Generasi indicator.<sup>54</sup> The Project was also expected to improve the quality of postnatal care through the IYCF training by coaching providers in how to conduct postnatal appointments. Detailed results are in Appendix B Table 8.15.<sup>55</sup>

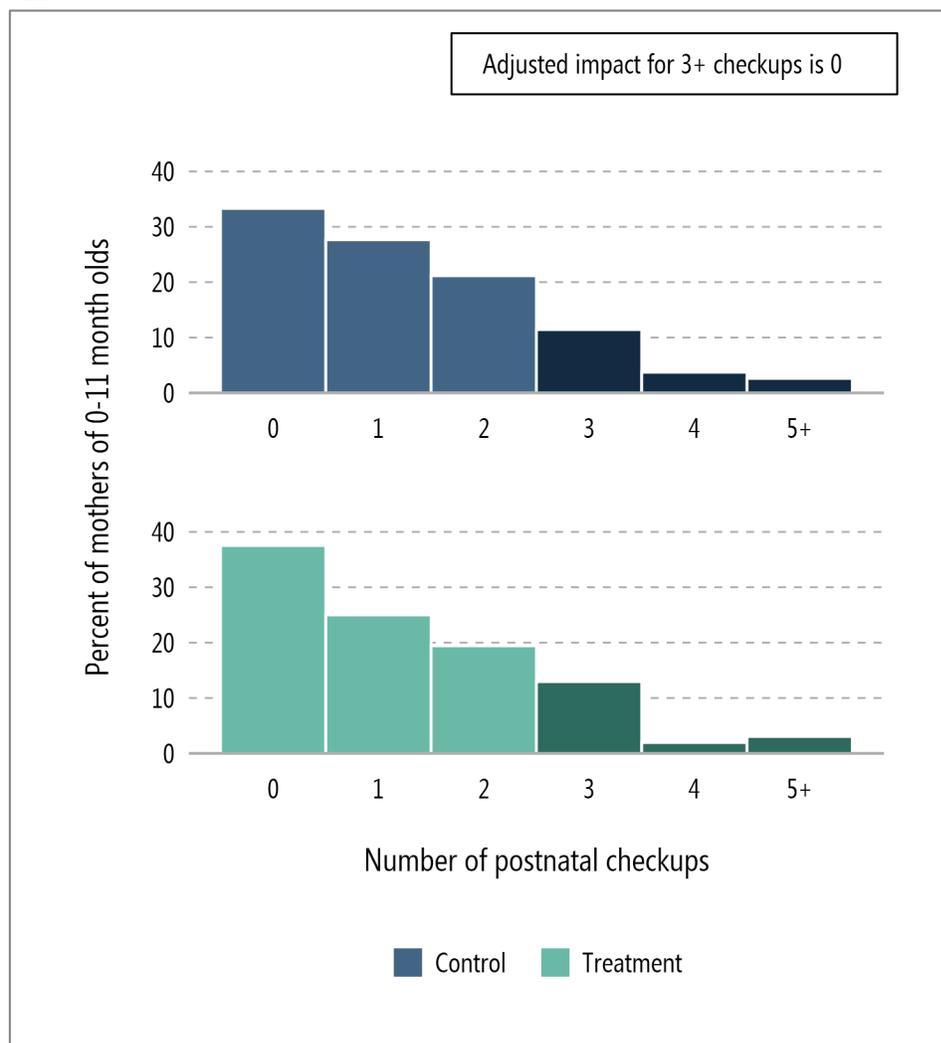
**Less than one in five mothers met the Generasi target of three postnatal checkups, and this target was met equally across treatment and control groups.** At endline, 63 percent of mothers in the treatment group received at least one postnatal checkup in the first six weeks after delivery. This was a marginally statistically significant 5 percentage points lower than in the control group. Only 18 percent of mothers in the treatment group received the recommended three postnatal checkups, the same percent as in the control group (Figure 8.9).<sup>56</sup> The average number of postnatal checkups among mothers who received them was two in both the treatment and control groups.

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<sup>54</sup> From Generasi Project documents, it is ambiguous whether these postnatal checkups are for mothers, babies, or both. For this reason we report checkups for both mothers and babies separately, but we use slightly different time frames. As we understand it, Generasi recommends mothers' checkups in the first week, second week, and sixth week, so the endline survey asked about checkups during the first six weeks for mothers. (We did not ask about the timing of the checkups, but only about the total number in this window.) For babies' checkups, we asked about checkups in the first four weeks, following the buku KIA, which recommends three check-ups for babies during this time frame.

<sup>55</sup> Buku KIA typically did not include information about postnatal checkups for mothers; therefore, our estimates include information from buku KIA (where it was available) and respondents' self-reports (where it was not).

<sup>56</sup> We are unable to assess changes in mothers' care since baseline because at baseline we only asked about checkups for babies.

**FIGURE 8.9 NUMBER OF POSTNATAL CHECKUPS FOR MOTHERS, AS REPORTED BY MOTHERS OF 0–11 MONTH OLDS**

Source: Caregiver baseline and endline surveys

Sample size: 2,867 caregivers

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

### 8.3.2 Postnatal care for babies

The first 28 days of life, the neonatal period, is a critical time to monitor infant health because it is the most vulnerable time for survival. Neonates do not have a fully developed immune system, increasing their vulnerability to infection (Basha et al. 2014). More than 80 percent of newborn deaths are due to premature birth, complications during labor and delivery, or infections including sepsis, meningitis, and pneumonia (Devine and Taylor 2018). In Indonesia in 2017, neonatal deaths accounted for 58 percent of all infant deaths (deaths in the first year of life) that year (UNICEF 2019). The buku KIA recommends three postnatal care visits for the baby in the

first four weeks: the first between 6 and 48 hours after birth, the second between 3 and 7 days after birth, and the third between 8 and 28 days after birth.<sup>57</sup>

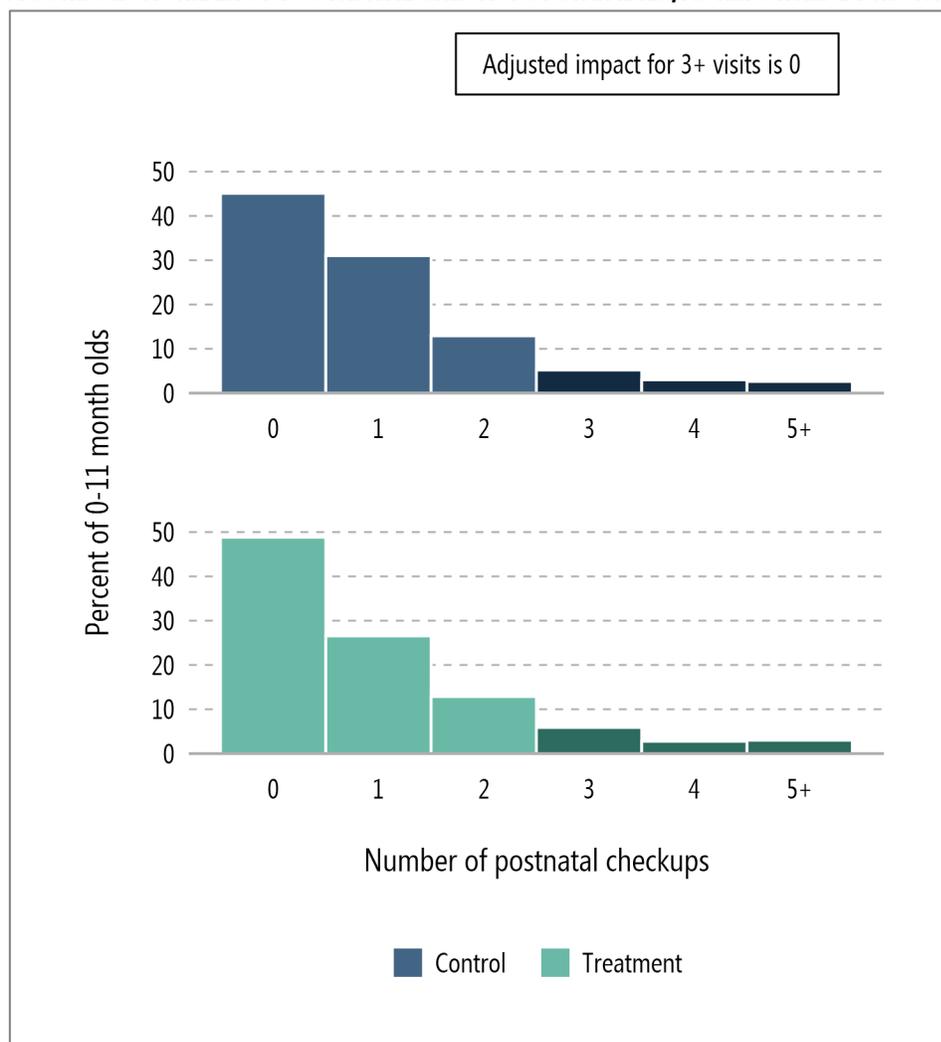
The Project expected to improve postnatal care for babies by encouraging mothers to attend the posyandu, where the baby could receive checkups. (We discuss posyandu attendance below.) In addition, IYCF training sought to improve the quality of postnatal checkups, and nutritional counseling sessions for mothers of young children (kelas balita) that take place at the posyandu sought to provide information on postnatal care topics such as breastfeeding, diarrhea prevention, and immunizations (immunizations are covered in Section 8.4). Detailed results are in Appendix B Tables 8.15–8.17.

**Less than one-quarter of babies received three or more postnatal checkups in the first four weeks, and this was similar in the treatment and control groups.** At endline, 55 percent of 0–11 month olds in the treatment group received at least one postnatal checkup in the first four weeks after delivery, but only 23 percent received the recommended three postnatal checkups (Figure 8.10). This measure was similar in the control group, suggesting that the Project did not impact it. Nevertheless, there is some evidence of positive and statistically significant impacts in this measure for West Kalimantan province (9 percentage points) and for households that were less remote (10 percentage points). The average number of postnatal checkups among mothers who received them was two in both the treatment and control groups. Overall, these measures were largely stagnant over time, with little difference between baseline and endline.

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<sup>57</sup> Although the buku KIA provides guidance for postnatal checkups for babies, the respondents' buku KIA typically did not include information about when these postnatal checkups occurred. Therefore, similar to our analysis of prenatal checkups, our estimates of postnatal checkups include information from buku KIA (where it was available) and respondents' self-reports (where it was not).

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**FIGURE 8.10 NUMBER OF POSTNATAL CHECKUPS FOR BABIES, AS REPORTED BY MOTHERS OF 0–11 MONTH OLDS**

Source: Caregiver baseline and endline surveys

Sample size: 2,882 caregivers

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

### 8.3.3 Visits to the posyandu and health providers supporting the posyandu

The posyandu has been a centerpiece of maternal and child health care delivery in Indonesia since its inception in the 1980s (Rokx et al. 2018). The KMS recommends that children should be weighed monthly until age 2 and the posyandu is seen the primary venue for weight monitoring. More recently, the MoH sought to help expand the role of the posyandu by offering more services, especially services that people traditionally received only at the puskesmas. This included, in some cases, length taking, vaccinations, Vitamin A distribution, prenatal care, IFA distribution, PMT distribution, and nutritional counseling sessions, among other services.

According to reports from kader posyandu, posyandu are typically conducted once a month in both treatment and control areas. On average, between four and five kader posyandu attend each

posyandu, together with one bidan. (Details about posyandu operations are in Appendix B Table 8.18.) As discussed in Chapter 5, posyandu are typically accessed close to where caregivers live. About 4 in 10 caregivers reported that the posyandu was held in their RT/RW, and 2 in 10 reported that it was held elsewhere in their dusun; less than 1 in 10 reported that it was held outside their desa.

Generasi was designed to encourage greater utilization of the posyandu, as progress on most of the Generasi indicators could be fulfilled at the posyandu. Because the posyandu offers services beyond just weighing, it is important that health providers like bidan (who may carry out prenatal or postnatal checkups, distribute IFA, distribute PMT, vaccinate children, administer Vitamin A, and so on) or puskesmas staff like bidan coordinators or nutritionists (who may oversee the bidan's and kader posyandu's work) regularly attend the posyandu.

Below we discuss children's participation in posyandu and health providers' interaction with posyandu staff and community members. Detailed results are in Appendix B Table 8.19–8.21.

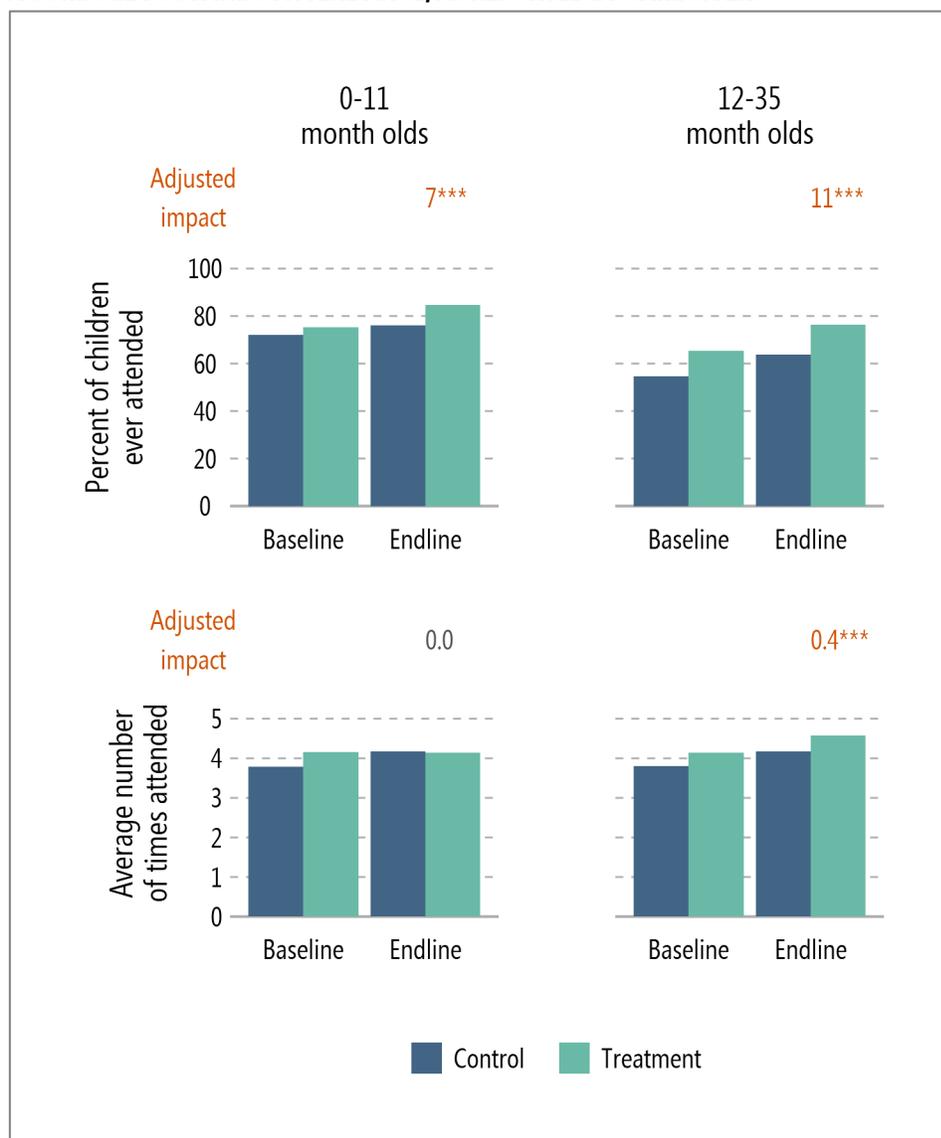
**The Project had a modest impact on the likelihood of posyandu attendance, but little impact on the frequency of attendance.** At endline, 85 percent of 0–11 month old children and 77 percent of 12–35 month old children in treatment areas had been taken to the posyandu in the previous six months (Figure 8.11).<sup>58</sup> These percentages were both higher than in control areas—by a statistically significant 7 and 11 percentage points, respectively. Consistent with this, the average posyandu in treatment areas served 43 children, a statistically significant 8 children more than in control areas. The impact on posyandu attendance for the full 0–35 month age group was largest in Central Kalimantan province (13 percentage points). Posyandu attendance also improved in the control group since the baseline, suggesting that there was a broader positive trend unrelated to the Project.

In qualitative responses, many kabupaten representatives noted an increase in posyandu participation. One representative said “posyandu activities are thriving. Before Generasi, the posyandu in this kabupaten did not operate. But since Generasi, posyandu for toddlers are held regularly every month. Even without the funding from Generasi, posyandu activities continue.”

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<sup>58</sup> We present results separately for 0–11 and 12–35 month olds because we expected the younger age group to be taken to the posyandu more frequently.

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**FIGURE 8.11 POSYANDU ATTENDANCE, AS REPORTED BY CAREGIVERS**

Source: Caregiver baseline and endline surveys

Sample size: 3,058 caregivers (0–11 month sample), 6,059 caregivers (12–35 month sample)

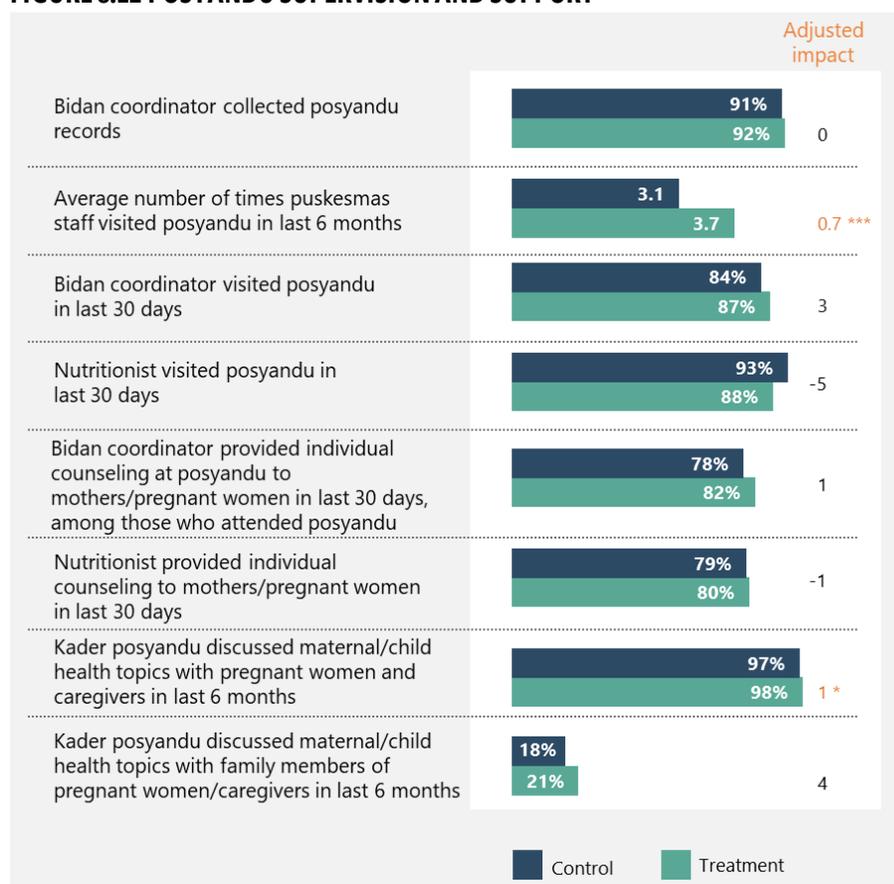
\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

Despite the impacts on the likelihood of attendance at the posyandu, the Project had very little impact on the frequency of attendance. Among caregivers in the treatment group who took children to the posyandu in the six months before the endline, the average frequency was four times (0–11 month olds) or five times (12–35 month olds), when the ideal frequency is monthly (especially for infants). This frequency was no different across treatment and control groups for 0–11 month olds, and only slightly higher for 12–35 month olds in the treatment group.

**Most providers report high levels of posyandu supervision and support, and there was no difference in these measures between treatment and control groups, or over time.**

Specifically, we examined the following measures of posyandu supervision and support (Figure 8.12):

- ***Bidan coordinator collected posyandu records.*** The posyandu is a key data source for tracking progress on the Generasi maternal and child health indicators discussed in Chapters 1 and 6. The bidan and bidan coordinators are thus responsible for collecting records about children’s weight and other services the posyandu provides. Nearly all bidan coordinators (92 percent) performed this function; there was no difference between treatment and control on this measure, but it improved more than 10 percentage points from baseline.
- ***Puskesmas staff visited posyandu.*** On average, kader posyandu in treatment areas report that puskesmas staff visited about four posyandu sessions over the last six months, which was just over half of the sessions held, assuming posyandu operate monthly. This frequency was slightly higher than in control areas. Almost 90 percent of bidan coordinators and nutritionists in treatment areas report visiting a posyandu in the last 30 days, very similar to the control group. There was also no difference between the treatment and control groups in the percent of posyandu that these providers visited in the previous 30 days, out of those they supervise.
- ***Puskesmas staff provided one-on-one counseling.*** Among bidan coordinators or nutritionists in treatment areas who visited the posyandu, about 8 in 10 reported that they provided individual counseling to mothers or pregnant women there in the previous 30 days. These proportions were similar in the control group.
- ***Kader posyandu provided one-on-one counseling.*** The Project also intended for kader posyandu to provide counseling on maternal and child health topics to other family members besides mothers. Consistent with their job function, nearly all kader posyandu reported providing such counseling to mothers or pregnant women in the last six months. However, only 21 percent of kader posyandu in the treatment group reported discussing these topics with other family members in the last six months, similar to the rate in the control group.

**FIGURE 8.12 POSYANDU SUPERVISION AND SUPPORT**

Source: Bidan, kader posyandu, bidan coordinator, and nutritionist baseline and endline surveys  
 Sample size: 874–1,960 kader posyandu, 206–242 bidan coordinators, 221 nutritionists  
 \* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

## 8.4 Immunizations

In the long run the Nutrition Project sought to reduce child morbidity and mortality, and immunizing children according to the prescribed schedule is an important step in achieving that goal (Andre et al. 2008; WHO 2013). Immunizations typically take place at the posyandu by the bidan or puskesmas staff who transport vaccines that need refrigeration in coolers. The Project also focused on Vitamin A supplements, which is important because more than 6 percent of deaths in children under 5 years of age are attributed to Vitamin A deficiency (Black et al. 2008). The Project aimed to improve immunization rates by including Generasi indicators for the percent of children over 12 months old who received the complete set of immunizations and the percent of children between 6 months and 5 years old who received Vitamin A twice a year. Detailed results for this section are in Appendix B Tables 8.22–8.24.

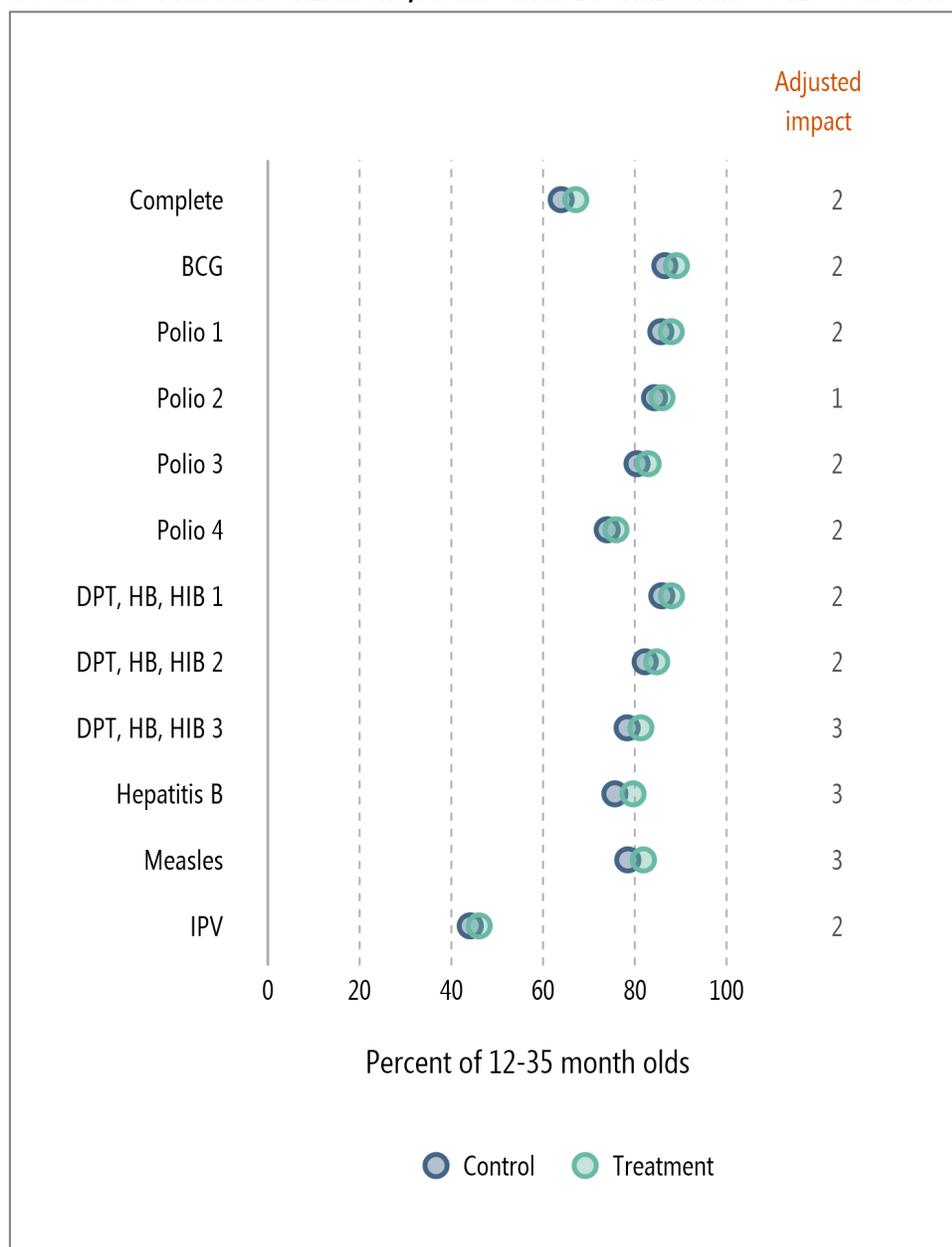
**The Project had no impact on children receiving the full set of immunizations, despite modest impacts for certain immunizations.** At endline, about two-thirds of children 12–35 months old in the treatment group achieved the Generasi indicator of receiving a complete set of

immunizations for their age, similar to the fraction in the control group (Figure 8.13). These rates were slightly higher than at baseline, by about 4 percentage points in the control group.

We also examined the rate of specific immunizations for children 12–35 months old (not shown, see Appendix B Table 8.23). (Many of these immunizations are supposed to be given well before age 12 months, but focusing on children over 12 months old accounts for potential delays in immunizations and is more directly comparable to the fully immunized indicator.) There were no statistically significant differences at endline between the treatment and control groups for any vaccine. Immunization rates were high—typically between 75 and 90 percent of children received each immunization, even in the control group. For most immunizations there was an increase from baseline in the control group, typically about 5 percentage points, suggesting an overall improvement over time in addition to the modest impact of the Project in treatment areas.

There were larger treatment-control differences for specific immunizations when the sample was restricted to children 24–35 months old (not shown, see Appendix B Table 8.S.8 - 8.S.10). Specifically, DPT3 (the third dose of the diphtheria, tetanus, and pertussis immunization) and measles immunization were both a statistically significant 5 percentage points higher in the treatment group compared to the control group. There were also consistently larger statistically significant impacts on these immunizations in West Kalimantan province, and for households in the lowest socioeconomic quintile.

**FIGURE 8.13 CHILD IMMUNIZATIONS, AS REPORTED BY CAREGIVERS OF 12–35 MONTH OLDS**



Source: Caregiver baseline and endline surveys

Notes: BCG=Bacillus Calmette-Guérin ; DPT=Diphtheria, tetanus, and pertussis; HB=Hepatitis B; HIB=Haemophilus influenzae type B; IPV=Inactivated polio vaccine

Sample size: 5,938–6,038 caregivers

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

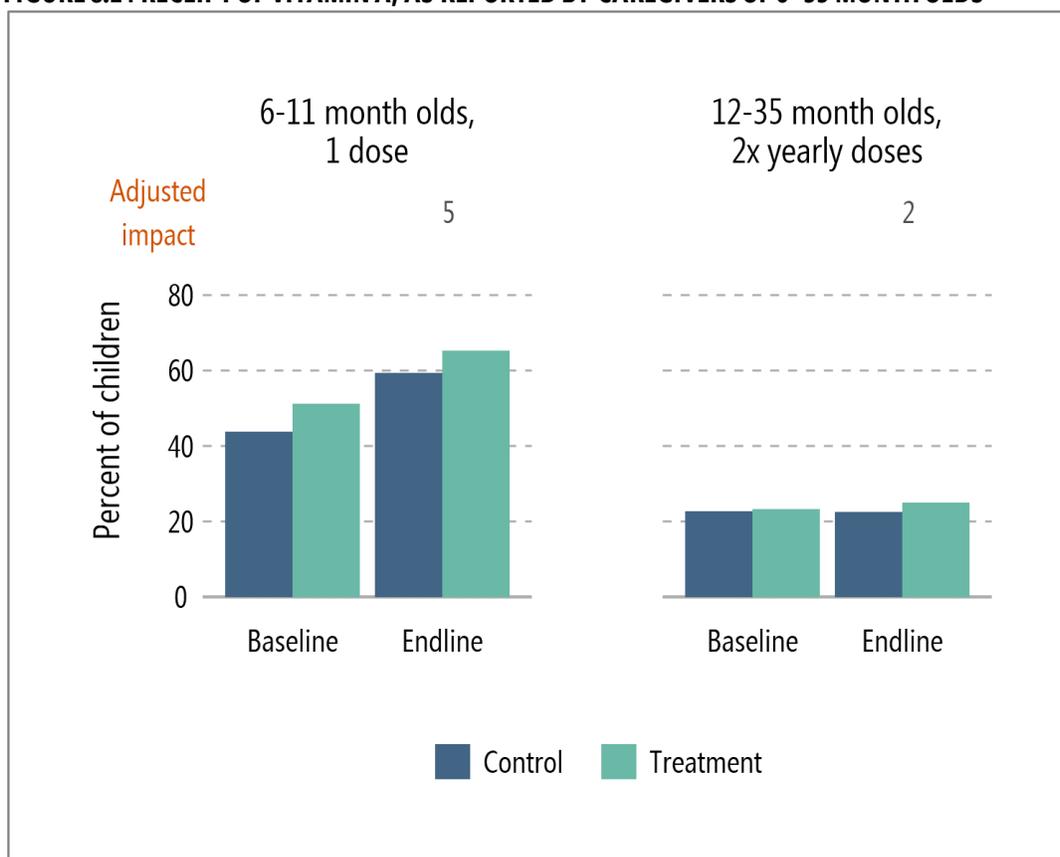
**Compliance with the recommended Vitamin A intake was low after 12 months of age, and was similar in the treatment and control groups.** The WHO recommends high-dose Vitamin A supplements to children 6–59 months old (once for children 6–11 months old and every 4 to 6 months for children 12–59 months old) in settings like Indonesia where Vitamin A deficiency is

common (WHO 2011a). This motivates the Generasi indicator of a twice-yearly dose of Vitamin A between the ages of 6 months and 5 years. At endline, only about one-third of children 6–35 months old in the treatment group had met this requirement (Figure 8.14).

This overall fraction masks important differences by child age. Specifically, about two-thirds of children 6–11 months old in the treatment group had received the recommended single dose of Vitamin A, a substantial improvement from baseline (by about 14 percentage points in the control group). However, only about one-quarter of children 12–35 months old in the treatment group had received the recommended twice-a-year intake of Vitamin A, similar to the fraction at baseline.

For all age groups, the fraction of children receiving the recommended dose was similar in the treatment and control groups. These findings suggest that there was an overall increase since baseline in receiving the first dose of Vitamin A—although not due to the Project—but this was not sustained for subsequent doses.

**FIGURE 8.14 RECEIPT OF VITAMIN A, AS REPORTED BY CAREGIVERS OF 6–35 MONTH OLDS**



Source: Caregiver baseline and endline surveys

Sample size: 515 caregivers of 6–11 month olds and 1,925 caregivers of 12–35 month olds (baseline), 1,520 caregivers of 6–11 month olds and 6,018 caregivers of 12–35 month olds (endline)

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**There was no difference between treatment and control areas in terms of posyandu offering immunizations or Vitamin A.** At endline, nearly all posyandu in treatment areas immunized children and provided Vitamin A supplements in the last 12 months, similar to the situation in control areas. The percentage of posyandu immunizing children increased by about 9 percentage points in both treatment and control areas since the baseline, suggesting an overall improvement not driven by the Project. Posyandu still lack some key equipment and supplies related to immunizations and Vitamin A: only about 13 percent of posyandu in treatment areas have a refrigerator for vaccines and about 75 percent had been out of stock of Vitamin A in the previous three months. These were very similar to the conditions in the control areas; in both types of areas the prevalence of refrigerators decreased substantially since baseline, but the prevalence of Vitamin A stockouts also decreased.

**Bidan and kader posyandu nearly universally reported that they promoted immunization and Vitamin A.** Ninety-eight percent of bidan and 96 percent of kader posyandu reported that they discussed routine immunization with pregnant women and caregivers of children under 5 in the last six months. Ninety-five percent of bidan and 86 percent of kader posyandu reported discussing the importance of Vitamin A. However, only about 63 percent of bidan coordinators supervised or assisted bidan in carrying out immunizations in the last 30 days. This measure was 10 percentage points higher in the treatment group, but the difference was not statistically significant. We might expect this measure to be higher in the treatment group if communities chose to use Generasi funds to help bidan coordinators supervise the posyandu.

## 8.5 Nutritional group counseling

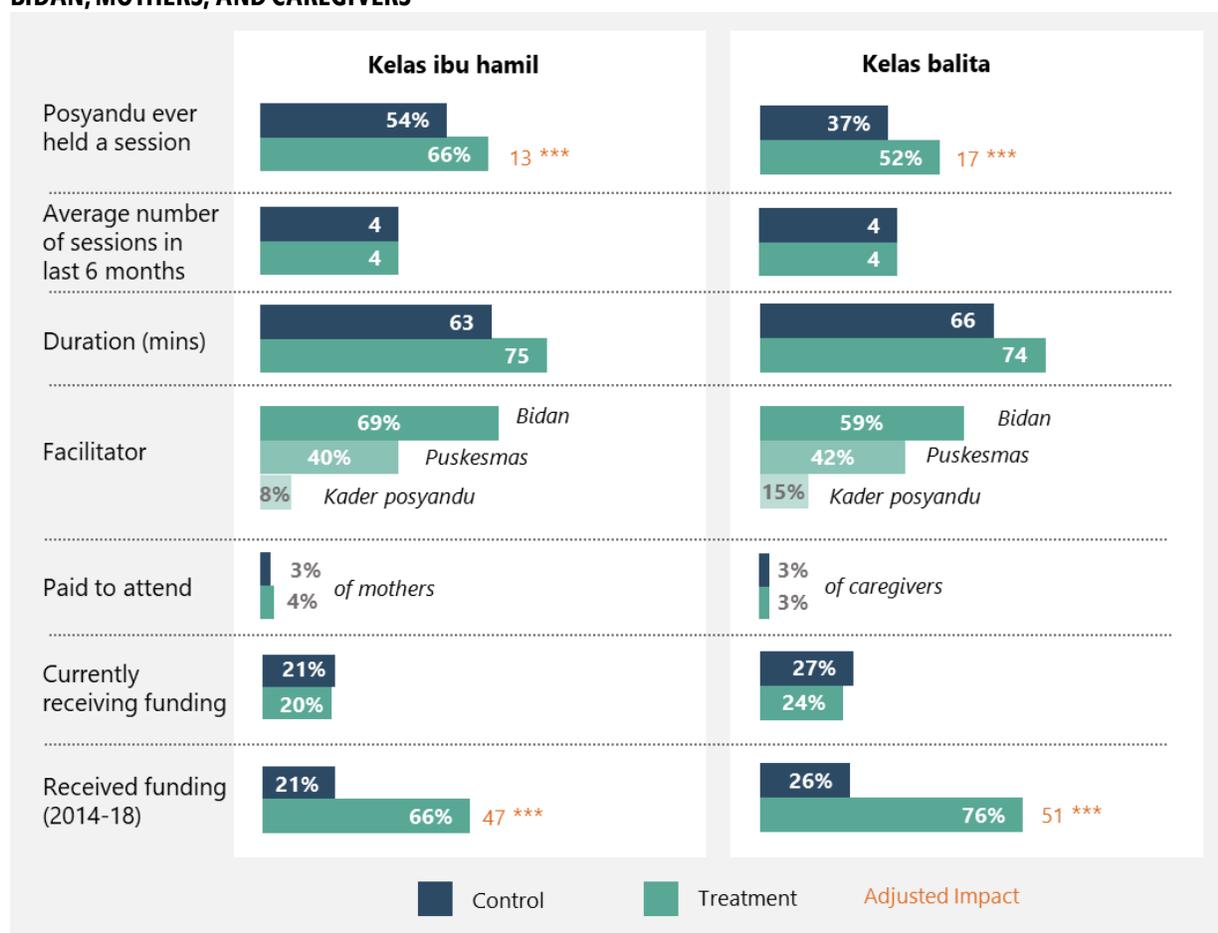
The Project envisioned that bidan and kader posyandu who received the IYCF training would pass on the knowledge they gained to pregnant women and caregivers of young children in their communities in two ways: (1) one-on-one prenatal and postnatal checkups, as well as other one-on-one counseling at the posyandu; and (2) nutritional counseling sessions, called kelas ibu hamil for pregnant women and kelas balita for caregivers of children ages 0–5, held in a group setting (hereafter referred to as group counseling sessions). The group counseling sessions emphasize the importance of critical IYCF practices during pregnancy and after childbirth, and include topics such as diet during pregnancy, breastfeeding, and complementary feeding, as well as broader maternal and child health topics such as the importance of giving birth with a trained health provider, child immunization, and hygiene. The Project expected that group sessions would complement one-on-one counseling.

The group counseling sessions pre-dated Generasi, but the Project aimed to generate greater participation by providing support through Generasi. Specifically, Generasi funds could be used to provide food and materials for the sessions and for transporting providers to hold the sessions. In addition, attendance by women and their spouses in the sessions were added as two Generasi indicators (one for kelas ibu hamil and one for kelas balita) when MCA-I began to support Generasi in 2013.

### 8.5.1 Group counseling availability and characteristics

Below we discuss whether posyandu held group counseling sessions, how often, and the characteristics of these sessions, such as duration, leadership, and cost. Figure 8.15 summarizes these findings and detailed results are in Appendix B Tables 8.25–8.40.

**FIGURE 8.15 GROUP COUNSELING AVAILABILITY AND CHARACTERISTICS, AS REPORTED BY KADER POSYANDU, BIDAN, MOTHERS, AND CAREGIVERS**



Source: Kader posyandu baseline and endline surveys (ever held a session, frequency of sessions, and funding information), bidan baseline and endline surveys (duration of sessions), and caregiver baseline and endline surveys (whether paid to attend)  
 Sample size: 898 kader posyandu, 783 bidan, 904–920 caregivers (kelas ibu hamil); 896 kader posyandu, 783 bidan, 1,416–1,429 caregivers (kelas balita)

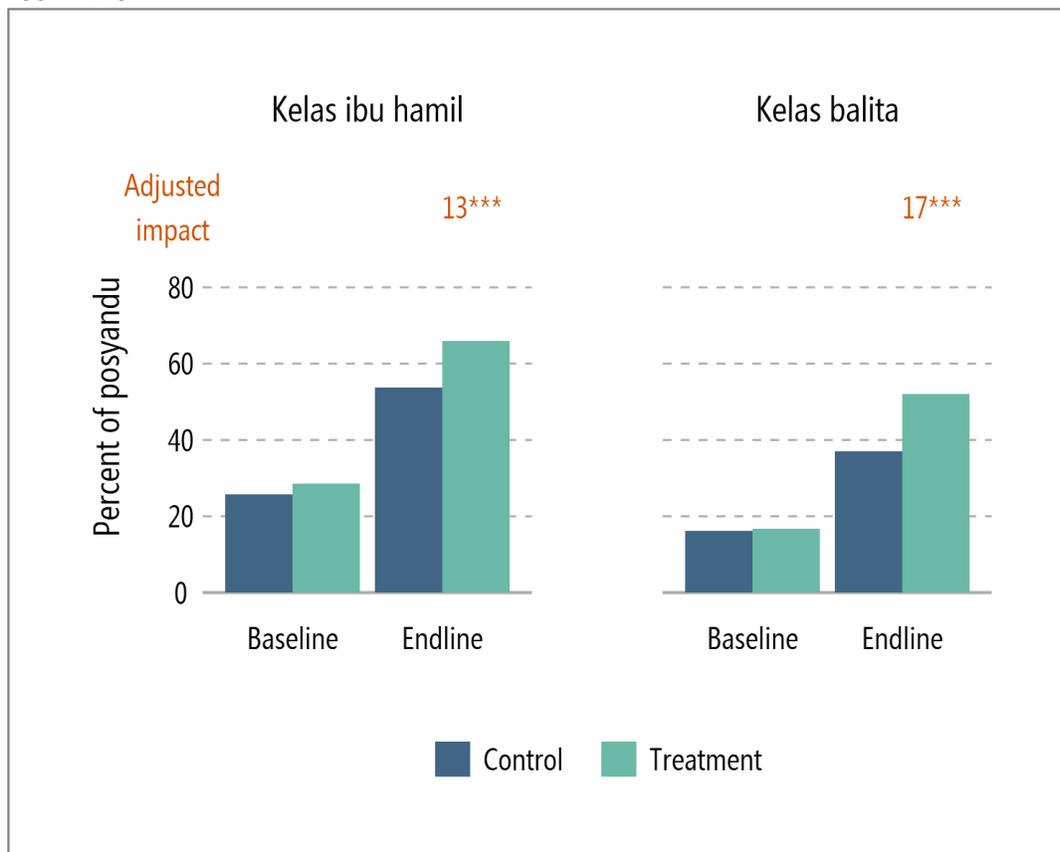
Note: Adjusted impacts that are not provided were not statistically significant.

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

 **Availability.** The Project induced more posyandu to hold group counseling sessions, yet a large fraction still did not hold them. According to kader posyandu, about 66 percent of posyandu in treatment areas had ever held a kelas ibu hamil and 52 percent had ever held a kelas balita (Figure 8.16). These percentages were higher than in the control group, by a statistically significant 13 and 17 percentage points, respectively. The percent of posyandu ever

holding sessions increased markedly from baseline, even in control areas (increases of 28 and 19 percentage points for kelas ibu hamil and kelas balita, respectively).

**FIGURE 8.16 POSYANDU HOLDING NUTRITIONAL GROUP COUNSELING SESSIONS, AS REPORTED BY KADER POSYANDU**



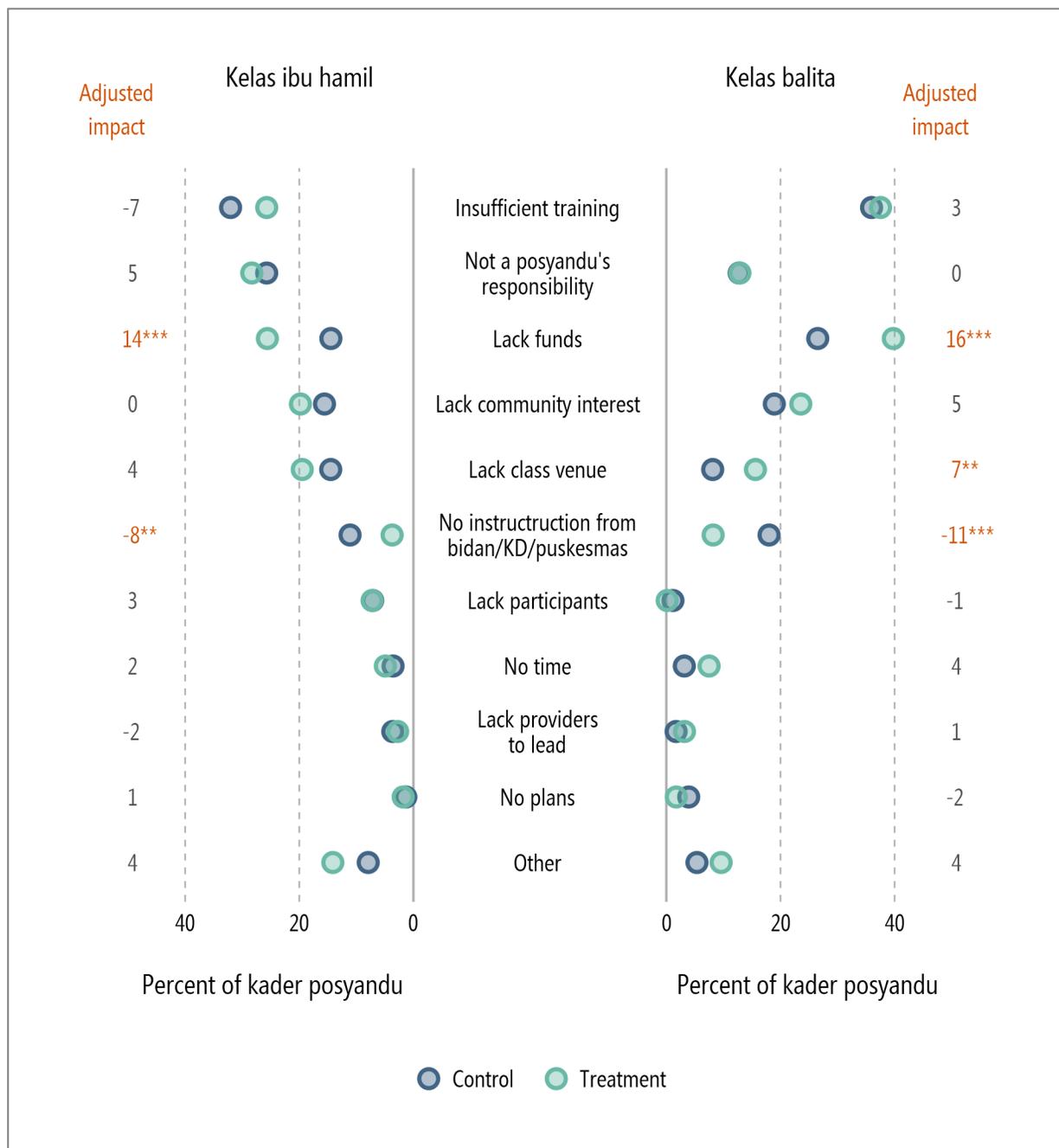
Source: Kader posyandu baseline and endline surveys

Sample size: 732 kader posyandu (baseline); 896 kader posyandu (endline)

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

In treatment areas, the most common reasons kader posyandu provided for posyandu not holding group counseling sessions included: these sessions not being perceived as the posyandu's responsibility (mostly for kelas ibu hamil), insufficient training among kader posyandu, a lack of funds, lack of community interest, and lack of location to hold the sessions (Figure 8.17). There was no statistically significant difference between treatment and control groups for most of these reasons, with two main exceptions. First, a lack of funds was more likely to be cited as a reason in treatment areas, for both types of sessions. It is possible that this was because Generasi had ended recently; posyandu that were used to holding sessions may have been used to receiving Generasi funding (as we show below) and were commenting on the loss of funds. Second, the bidan, kepala desa, or puskesmas staff not having given instructions to conduct sessions was less likely to be cited as a reason in treatment areas for both types of sessions, suggesting that these actors had been more supportive of these sessions in Project areas.

**FIGURE 8.17 REASONS POSYANDU NEVER HELD NUTRITIONAL GROUP COUNSELING SESSIONS, AS REPORTED BY KADER POSYANDU**



Source: Kader posyandu endline surveys

Sample size: 373 kader posyandu (kelas ibu hamil); 527 kader posyandu (kelas balita)

Note: KD=Kepala desa

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test



**Frequency.** The Project had no effect on the frequency of group counseling sessions, which were on average held four times in six months. Kelas ibu hamil and kelas balita should ideally be held once a month. The rationale for this goal is that monthly sessions enable women to receive timely information on pregnancy and early childhood. However, among posyandu that held group counseling sessions, they only held sessions about once every one and a half months, on average. The average number of sessions was similar in the treatment and control groups.



**Facilitator.** Bidan led the majority of kelas ibu hamil and kelas balita, but kader posyandu were more likely to lead kelas ibu hamil in treatment areas. The group counseling sessions were designed such that bidan were expected to lead kelas ibu hamil, and kader posyandu were expected to lead kelas balita. However, we find that bidan typically led both sessions. In treatment areas, 69 percent of kader posyandu report that bidan led the last kelas ibu hamil, 40 percent reported that a puskesmas staff member (presumably bidan coordinators or nutritionists) led it, and only 8 percent reported that the kader posyandu led it.<sup>59,60</sup> There was little change from baseline in these measures and they were similar in the treatment and control groups, except that almost no sessions in the control group were led by kader posyandu.

Most kelas balita were also led by bidan. In treatment areas, 59 percent of kader posyandu reported that bidan led the last session, whereas 42 percent reported that it was led by puskesmas staff and 15 percent by kader posyandu. Therefore, although a higher share of kader posyandu were leading kelas balita than kelas ibu hamil, this was still fairly uncommon. None of these results were statistically different between treatment and control groups.

The Project envisioned that bidan and puskesmas staff would support the sessions even if they did not lead them. Among kader posyandu in treatment areas that reported that the bidan did not lead the last kelas ibu hamil, about half reported that the bidan attended the session regardless (similar in control areas). The equivalent measure was about two-thirds for kelas balita (15 percentage points higher than in control areas.) Kader posyandu in treatment areas also reported that bidan coordinators and nutritionists supported about half of the sessions they did not lead, for both types of sessions (similar in control areas). Overall this suggests a moderate amount of support from bidan and puskesmas staff, but that the impacts of the Project on this support was modest.



**Duration.** Group counseling sessions were just over an hour in duration, on average, and the Project did not substantively change their duration. The duration of sessions

<sup>59</sup> This question allowed for multiple responses so results sum to greater than 100 percent.

<sup>60</sup> Our measure of facilitator is based on kader posyandu reports of who led the most recent session. For caregivers we have a similar measure, based on who led the sessions the respondent attended. Compared to kader posyandu reports, caregivers were similarly likely to report that bidan or other puskesmas staff led the sessions, but were more likely to report that kader posyandu led the sessions (in treatment areas, 25 percent for kelas ibu hamil and 49 percent for kelas balita).

might affect how much exposure participants received to counseling session material as well as their likelihood of attendance due to the time commitment required. For example, longer sessions might provide more comprehensive information, but might reduce attendance if participants find the time commitment burdensome. For kelas ibu hamil, bidan in treatment areas reported that sessions were on average 81 minutes, a statistically significant 11 minutes longer than in control areas but only marginally significant.<sup>61</sup> For kelas balita, bidan reported that sessions were on average 69 minutes in the treatment group and this was not statistically different from the control group.

**Rp** **Cost. The vast majority of participants did not pay for the group counseling sessions.** We asked about cost because implementers expressed concern about cost being a deterrent to attendance for families. However, this was not the case because less than 5 percent of participants in kelas ibu hamil and kelas balita reported paying for them (similar in the treatment and control groups).

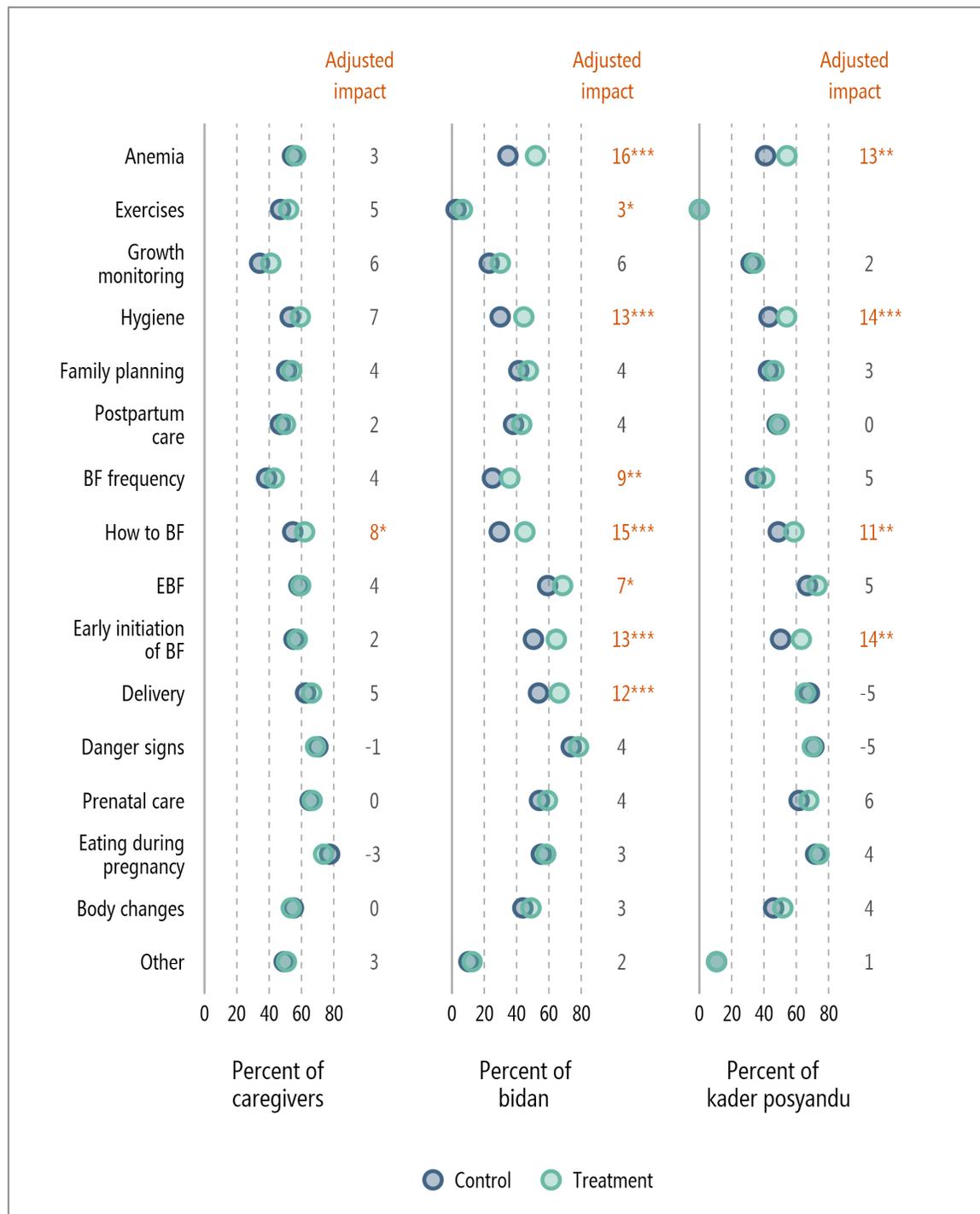
 **Content. Topics that were supposed to be discussed in the sessions were typically reported by about half of attendees and providers; there is some evidence that the Project increased discussion of key topics in kelas ibu hamil.** We asked women, kader posyandu, and bidan involved in the sessions what topics were discussed in the sessions, using a checklist from the UNICEF IYCF Facilitator Guide distributed at the IYCF training. For kelas ibu hamil in treatment areas, most topics were mentioned by between about 40 percent and 70 percent of respondents (Figures 8.18 and 8.19). There were some statistically significant differences between the treatment and control groups in topics covered, based on provider reports. For example, both kader posyandu and bidan reported that early initiation, how to correctly breastfeed, hygiene or handwashing, and maternal anemia were discussed at higher rates in the treatment group, by between about 10 and 14 percentage points. However, these differences were not statistically significant based on mothers' reports.

For kelas balita in treatment areas, most topics were mentioned by between about 30 percent and 80 percent of respondents, with the most common topics discussed being exclusive breastfeeding and complementary feeding. The evidence that the Project affected topics discussed is weaker than for kelas ibu hamil; there were some modest statistically significant differences between the treatment and control groups, but these varied in sign and were not consistent across kader posyandu and bidan.

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<sup>61</sup> In Figure 8.15 we show duration reports from bidan for both types of sessions because bidan led the majority of sessions. However, we have reports from caregivers, bidan, and kader posyandu for both sessions. Results are similar, suggesting a similar duration and modest impacts at best, but the statistical significance of the impacts varies across respondents.

**FIGURE 8.18 TOPICS DISCUSSED AT KELAS IBY HAMIL IN LAST SIX MONTHS, AS REPORTED BY CAREGIVERS, KADER POSYANDU, AND BIDAN**



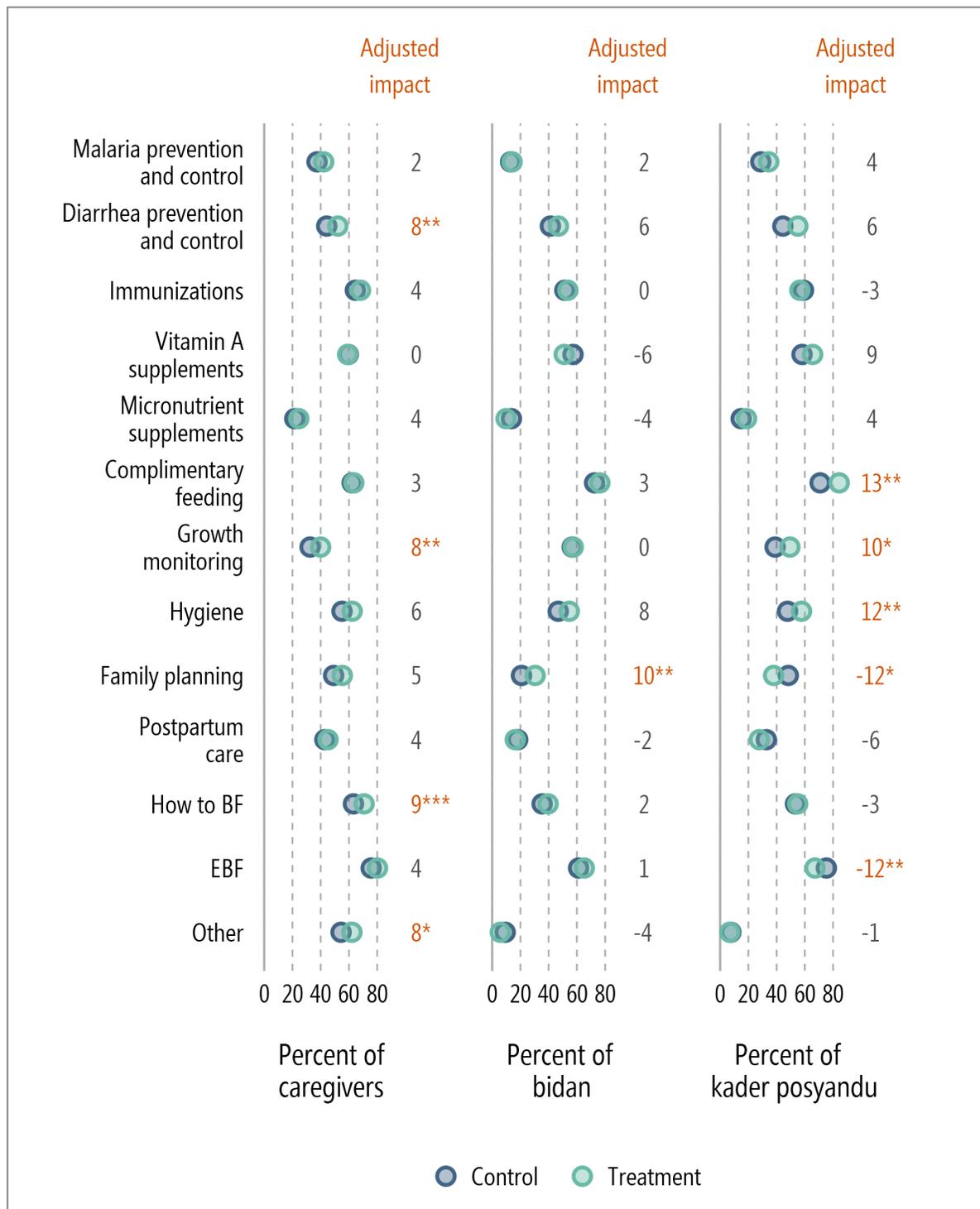
Source: Caregiver, bidan, and kader posyandu endline surveys

Note: EBF = exclusive breastfeeding, BF= breastfeeding

Sample size: 913 caregivers, 672 bidan, 485 kader posyandu

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**FIGURE 8.19 TOPICS DISCUSSED AT KELAS BALITA IN LAST SIX MONTHS, AS REPORTED BY CAREGIVERS, KADER POSYANDU, AND BIDAN**



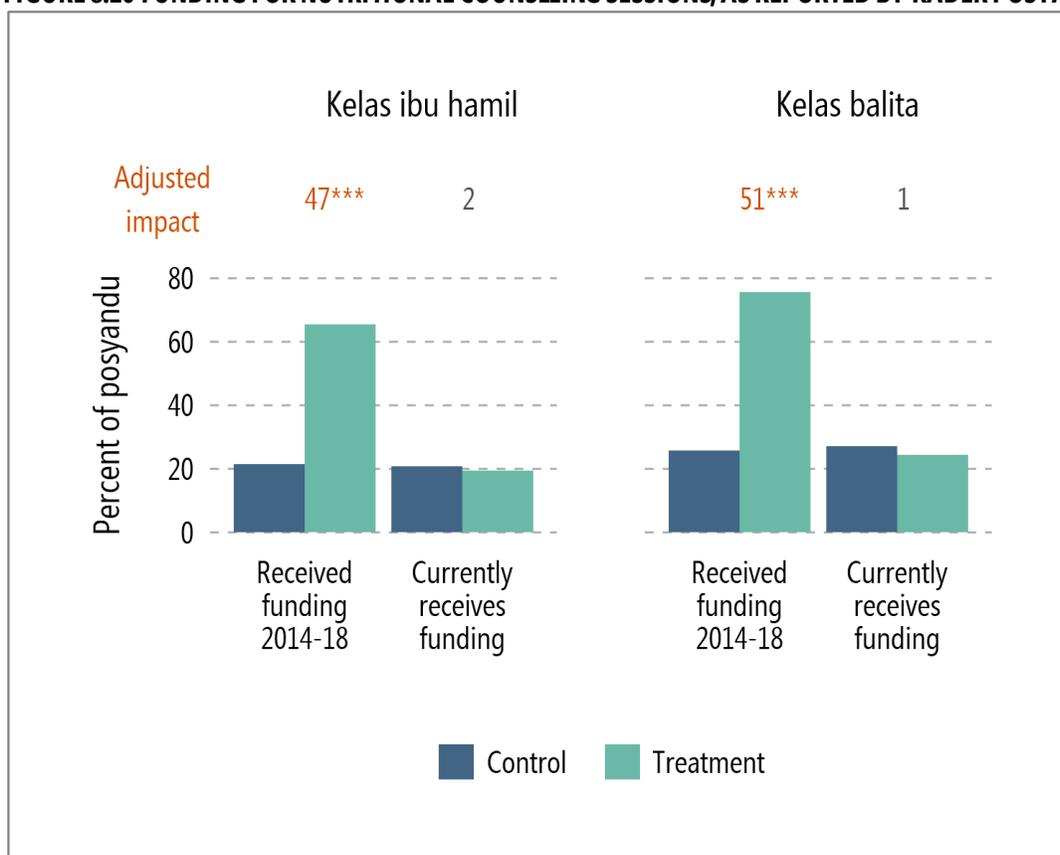
Source: Caregiver, bidan, and kader posyandu endline surveys

Sample size: 1,427 caregivers, 334 bidan, 336 kader posyandu

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**Funding.** Posyandu in treatment areas were substantially more likely to receive funding for sessions during the Project implementation period. According to kader posyandu, about two-thirds of posyandu in treatment areas received funding for kelas ibu hamil and about three-quarters received funding for kelas balita between 2014 and 2018, the Project implementation period (Figure 8.20). For both types of sessions, this was about triple the rate in the control group. However, when asked about current funding for these sessions, the fraction reporting funding was similarly low in both types of areas (about one-fifth or one-quarter). Thus, the Project represented a temporary increase in funding for nutritional counseling sessions over the Project implementation period, through Generasi.

**FIGURE 8.20 FUNDING FOR NUTRITIONAL COUNSELING SESSIONS, AS REPORTED BY KADER POSYANDU**



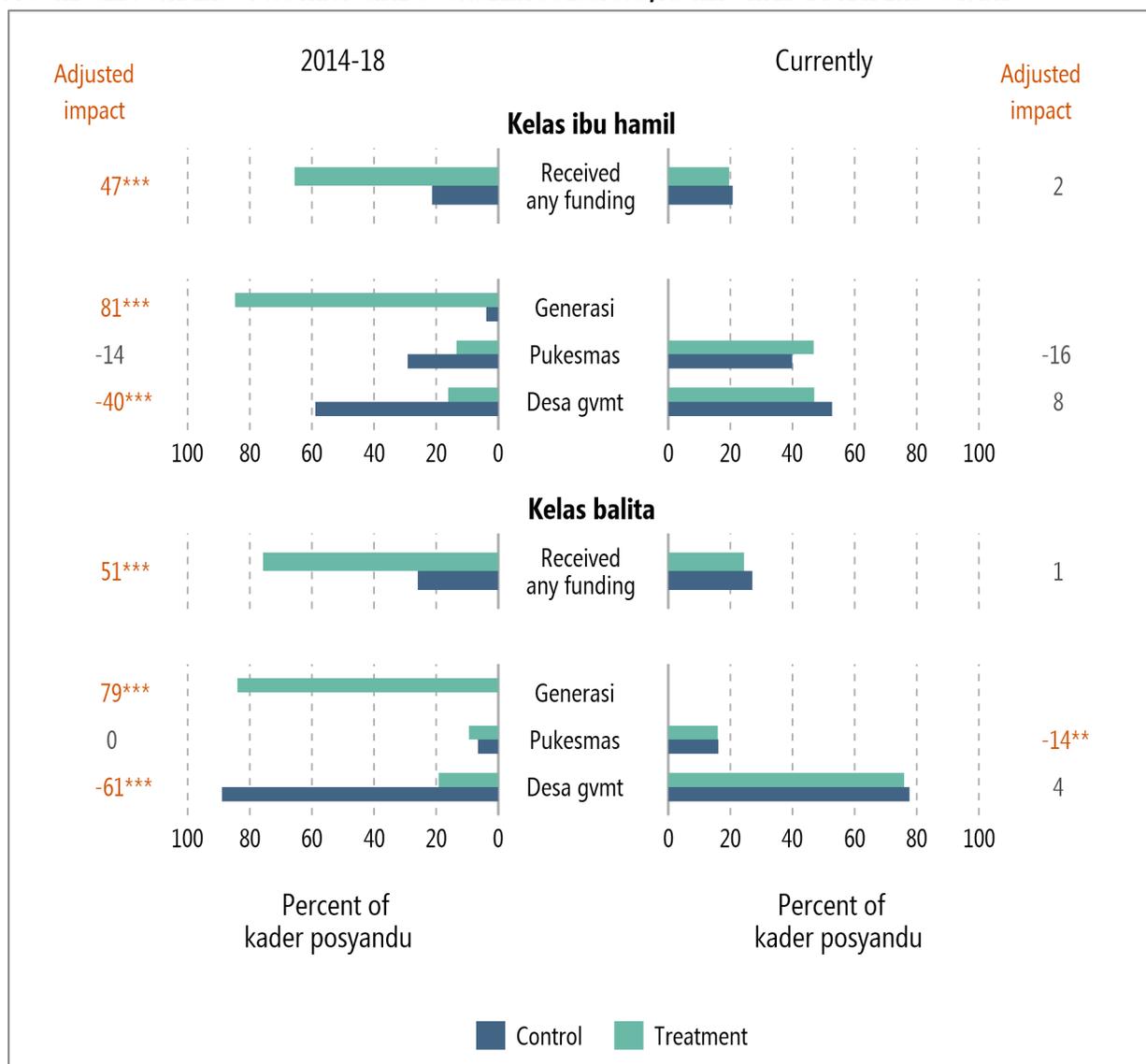
Source: Caregiver baseline and endline surveys

Sample size: 496 kader posyandu

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

Consistent with this, the most common funding source for kelas ibu hamil in treatment areas between 2014 and 2018 was Generasi (reported by 85 percent of kader posyandu), whereas in control areas it was the desa government and puskesmas (reported by 59 and 29 percent of kader posyandu, respectively) (Figure 8.21). In contrast, the most common sources of current funding were similar in treatment and control areas, namely the desa government and puskesmas. This pattern of findings was similar for kelas balita, except that the desa government was much more likely to be the alternative source of funding to Generasi rather than the puskesmas.

**FIGURE 8.21 FUNDERS OF NUTRITIONAL COUNSELING SESSIONS, AS REPORTED BY KADER POSYANDU**



Source: Kader posyandu baseline and endline surveys

Sample size: 228–503 kader posyandu (kelas ibu hamil); 207–361 kader posyandu (kelas balita)

Note: Funding sources are among kader posyandu who reported receiving funding for each kelas.

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

### 8.5.2 Group counseling session attendance

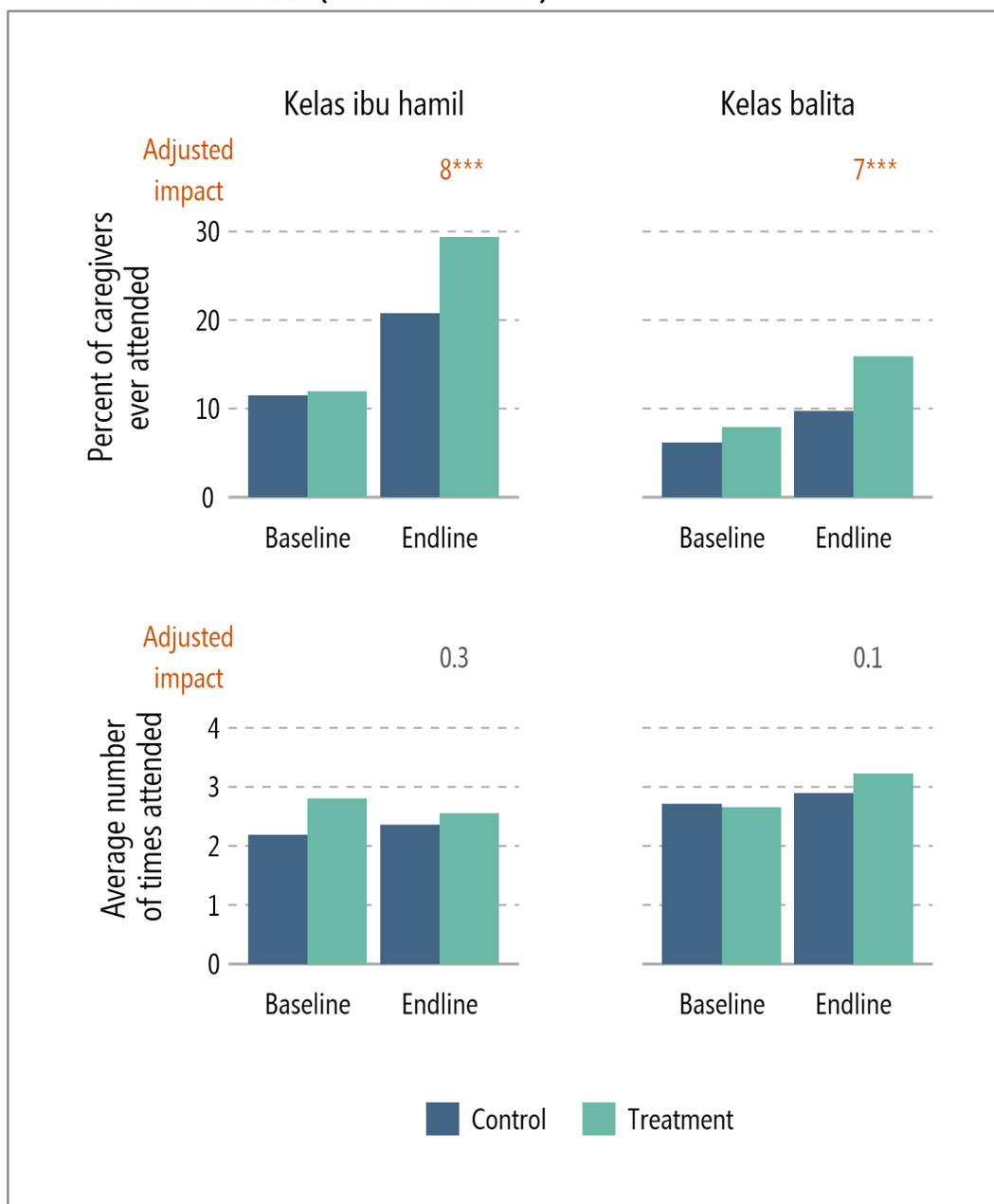
In addition to understanding availability and characteristics of group counseling sessions, we also explored whether women and their spouses attended (the Generasi indicators) and how frequently. Detailed results are in Appendix B Tables 8.25–8.40.



**Ever attendance.** The Project had an effect on the likelihood of attending group counseling sessions, but no effect on the frequency of attendance; overall attendance

**was low.** Twenty-nine percent of mothers in treatment areas reported ever attending a kelas ibu hamil, a statistically significant 8 percentage points higher than in control areas (Figure 8.22). For kelas balita, only about 16 percent of caregivers in treatment areas ever attended a session, a statistically significant 7 percentage points higher than in control areas. These positive impacts are consistent with the impact evaluation of Generasi conducted by the World Bank, which found an impact of about 8 percentage points on attending either type of session (Olken et al. 2018). The impact on kelas balita attendance was larger for older cohorts (about 7 percentage points for 12–35 month olds compared to 3 percentage points for 0–11 month olds), consistent with the younger cohorts having limited exposure because Generasi ended in 2018. Even in the control group there was a modest improvement in ever attendance since baseline—an increase of about 9 percentage points for kelas ibu hamil and 4 percentage points for kelas balita. Mothers and caregivers who attended sessions attended on average three sessions (similar for both types of sessions), and this was similar in the treatment and control groups.

**FIGURE 8.22 PERCENT OF CAREGIVERS EVER ATTENDING NUTRITIONAL GROUP COUNSELING SESSIONS AND NUMBER OF TIMES ATTENDED (AMONG ATTENDING)**



Source: Caregiver baseline and endline surveys

Sample size: endline, top panel: 3,040 caregivers (kelas ibu hamil), 9,115 caregivers (kelas balita); endline, bottom panel: 919 caregivers (kelas ibu hamil), 1,426 caregivers (kelas balita); baseline, top panel: 2,997 caregivers (kelas ibu hamil), 3,034 caregivers (kelas balita); bottom panel: 386 caregivers (kelas ibu hamil), 227 caregivers (kelas balita)

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

When asked *why* they did not attend kelas ibu hamil, more than three-quarters of mothers reported they did not know about the group counseling sessions. The share of mothers providing

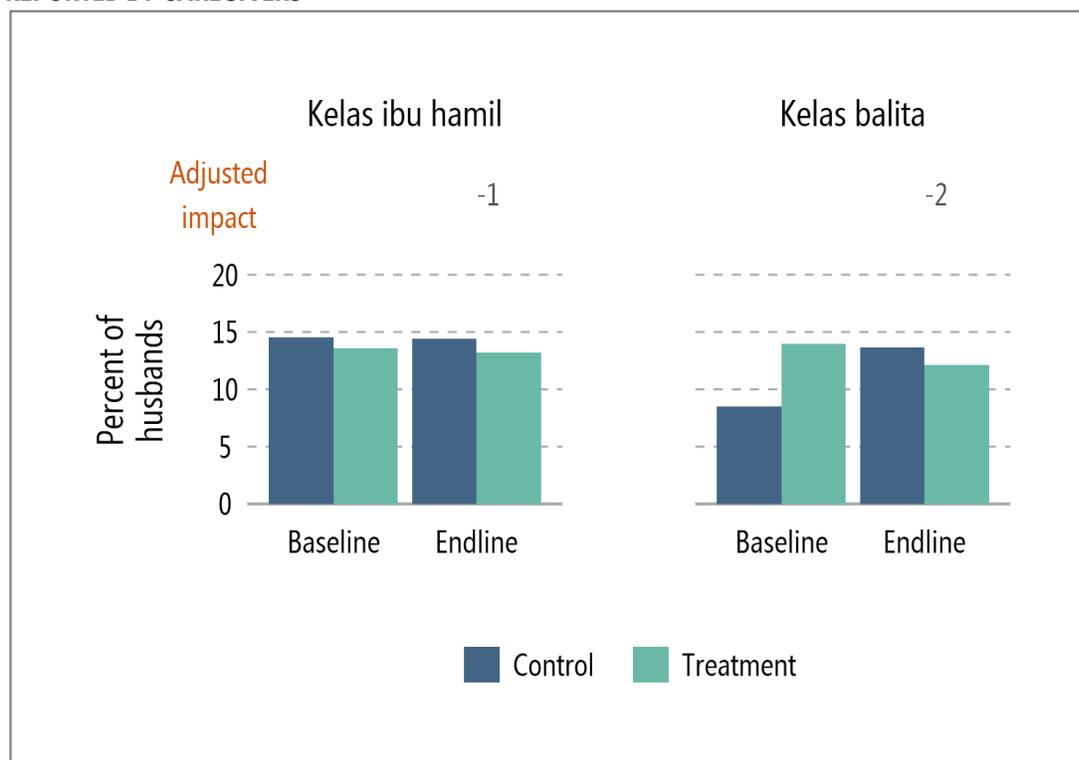
this answer declined by about 10 percentage points between baseline and endline, which suggests that awareness of group counseling is increasing, but only modestly. The only other common answers were lack of time or the distance being too far. There was no difference between treatment and control groups for any of these measures. Results were largely the same for kelas balita, with an even higher share (87 percent) in the treatment group reporting they did not know about the availability of group counseling for caregivers.



**Attendees.** The Project affected the average number of women attending group counseling sessions, but not the number of men, which was very low. Kelas ibu hamil were designed to be small, intimate sessions in which pregnant women received counseling. Kelas balita often included more participants because they often occurred following the posyandu meeting attended by caregivers of 0–5 year olds. Our endline data corroborate this—on average in treatment groups 10 women attended kelas ibu hamil and 36 women attended kelas balita. Consistent with the positive impacts on the likelihood of attending group counseling, the average number of attendees was slightly higher than in the control group (by a statistically significant 2 women for kelas ibu hamil and 6 women for kelas balita).

Men rarely attended group counseling sessions, even though Generasi added an indicator for husbands' participation in the sessions because of their important role in household decision-making, especially around nutrition. Only about 1 in 10 women reported that their husband attended a kelas ibu hamil or kelas balita (Figure 8.23), and kader posyandu and bidan both reported that on average about one to two men attended the last session. There was no statistically significant difference between treatment and control groups in these measures, except that the number of men that bidan report attending the last kelas ibu hamil was slightly higher in the treatment group (this only amounts to about one additional man every three sessions).

**FIGURE 8.23 NUTRITIONAL GROUP COUNSELING SESSION ATTENDANCE BY CAREGIVERS' HUSBANDS, AS REPORTED BY CAREGIVERS**



Source: Caregiver baseline and endline surveys

Sample size: 227 caregivers (baseline, kelas ibu hamil), 920 caregivers (endline, kelas ibu hamil); 386 caregivers (baseline, balita), 1,419 caregivers (endline, kelas ibu hamil)

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

## 8.6 Feeding practices

Age-appropriate nutrition in early childhood, which includes age-appropriate breastfeeding and complementary feeding of solid and semi-solid foods, is critical for healthy growth. In this section we examine both of these dimensions of child nutrition.

### 8.6.1 Breastfeeding and formula feeding

The WHO and UNICEF recommend several breastfeeding practices that are important to provide infants with nutrients needed for healthy growth and development, and to reduce the risk of mortality from infectious diseases (UNICEF 2015). In particular, early initiation of breastfeeding, exclusive breastfeeding until age 6 months, and continued breastfeeding until age 24 months are associated with a decreased risk of morbidity and mortality from diseases such as diarrhea and pneumonia (NEOVITA Study Group 2016; Debes et al. 2013; Lamberti et al. 2011, 2013; Kramer and Kakuma 2002; Victora et al. 2016).

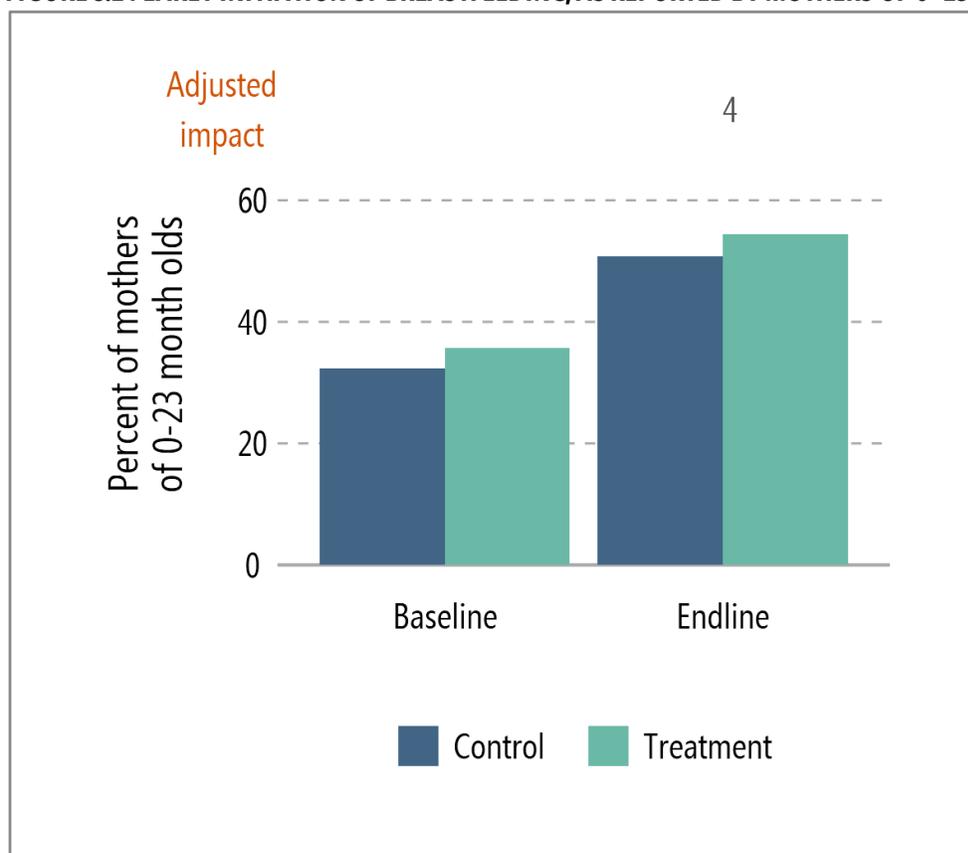
These WHO and UNICEF recommendations were central to the Nutrition Project's IYCF training, and the Project intended that the training would help kader posyandu, bidan,

nutritionists, and bidan coordinators promote these recommendations in the communities in which they worked. The Project expected that one-on-one counseling, nutritional group counseling sessions and visits to the posyandu would be the primary opportunities for providers to encourage these breastfeeding practices.

In this section we focus on whether the Project was able to improve the WHO and UNICEF-recommended practices regarding early initiation, exclusive breastfeeding, and continued breastfeeding. To measure these practices, we primarily relied on the UNICEF and WHO guide that defines appropriate measures (WHO 2008), but we also used other measures when we sought to present a more comprehensive picture of feeding. For example, WHO and UNICEF define exclusive breastfeeding as “infants 0–5 months of age who received only breast milk during the previous day” (WHO 2008). However, this indicator could overstate the extent to which a child receives only breastmilk since a child who did not receive anything other than breastmilk in the previous day could still be getting formula or other liquids or food regularly. Therefore, we also present a since-birth indicator, which counts infants as exclusively breastfed only if they never received anything other than breastmilk (Greiner 2014). Whereas the WHO definition of exclusive breastfeeding might overstate the share of children receiving nothing but breastmilk, this since-birth indicator could understate it if an infant had very minimal and short-term exposure to other liquids or supplements.

Detailed results for this section are found in Appendix B Tables 8.41–8.46 (all UNICEF/WHO indicators in these tables are marked with a ).

**At endline, about half of mothers initiated breastfeeding within one hour of birth; this measure improved substantially from baseline, but was not impacted by the Project.** Early initiation of breastfeeding for the 0–23 month old age group (the focus of the WHO and UNICEF definition) increased substantially since baseline, when only about one-third of mothers practiced early initiation (Figure 8.24). However, the increase was similar in the treatment and control groups, suggesting that it was not due to the Project.

**FIGURE 8.24 EARLY INITIATION OF BREASTFEEDING, AS REPORTED BY MOTHERS OF 0–23 MONTH OLDS**

Source: Caregiver baseline and endline surveys

Sample size: 2,065 caregivers (baseline); 4,596 caregivers (endline)

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**Nearly all children were breastfed at some point, and continued breastfeeding was similar in the treatment and control groups.** Almost all mothers in the treatment group reported that they had ever breastfed, similar to the situation at baseline. About three-quarters of 12–15 month old children and two-thirds of 20–23 month old children were breastfed in the previous day (the WHO and UNICEF definitions of continued breastfeeding at 1 and 2 years, respectively). All these measures were similar in the control group. The median duration of breastfeeding was 14 months in the treatment group and 12 months in the control group (it was not possible to assess the statistical significance of this difference in medians given the use of weights and clustering in the analysis).

**The Project had a positive impact on exclusive breastfeeding.** About 45 percent of 0–5 month olds in the treatment group were exclusively breastfed at endline using the WHO and UNICEF definition (based on feeding in the previous day), a statistically significant 9 percentage points higher than in the control group (Figure 8.25). Examining this measure by age shows that exclusive breastfeeding decreases from around 60 percent in the first month to 20 percent by the fifth month (Figure 8.26). (Most of this change was not due to women stopping breastfeeding but introducing other liquids or solids too early, as we discuss below.) A related but less strict

measure for this age group is predominant breastfeeding, which allows children to be fed some liquids besides breastmilk, provided that breastmilk is still the predominant form of nourishment.<sup>62</sup> About 58 percent of 0–5 month olds in the treatment group met this criterion in the previous day, a statistically significant 13 percentage points higher than in the control group.

Using the more stringent Greiner (2014) definition of exclusive breastfeeding (based on feeding since birth), 20 percent of 0–5 month olds in the treatment group were exclusively breastfed, about 4 percentage points higher than but not statistically significantly different from the rate in the control group. For the full 6–35 month old sample, this more stringent measure (based on feeding from birth until 6 months old) was 24 percent in the treatment group, a statistically significant 4 percentage points higher than in the control group.<sup>63</sup> (This is similar in magnitude to the impact for 0–5 month olds, but becomes statistically significant because of the larger sample size.) This is more modest in percentage point terms than the impact using the less stringent definition, but is similar in percent terms (about a 20 percent improvement relative to the control group).

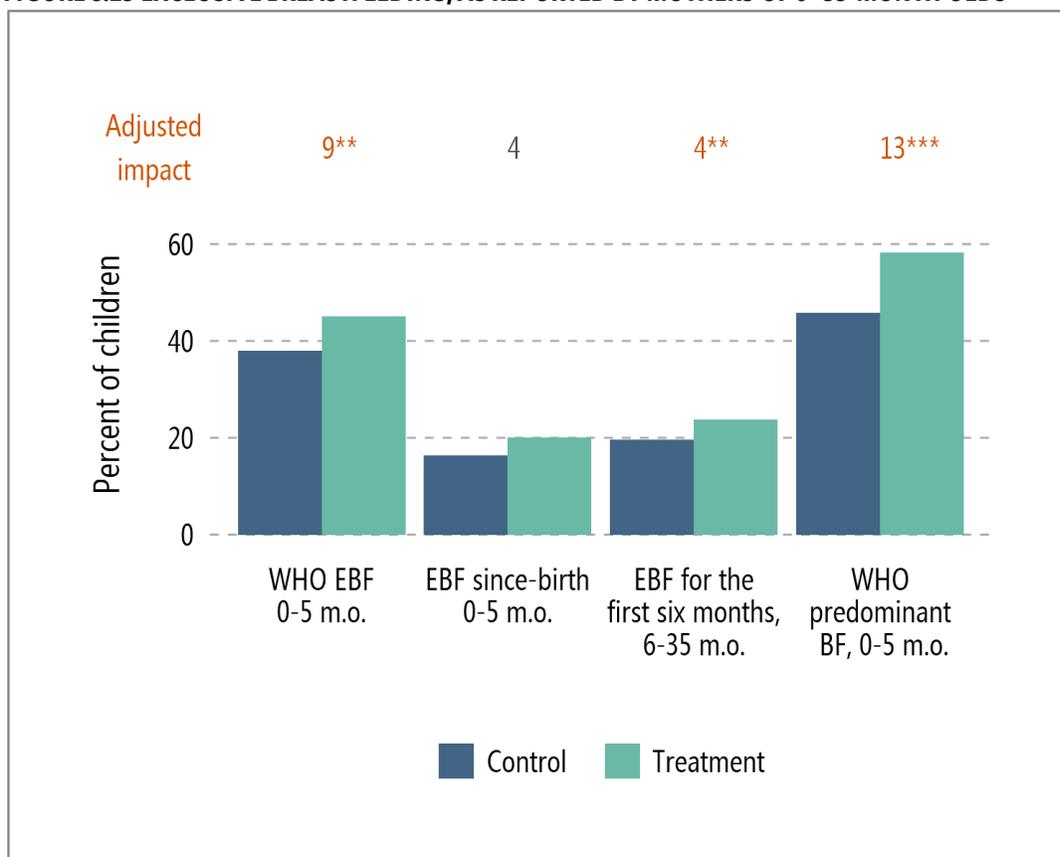
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<sup>62</sup> This measure allows children to have received non-nutritive liquids in the previous day, such as water, juice, or tea.

<sup>63</sup> This is higher than the equivalent measure for 0–5 month old children, even though one might expect it to be lower because some 0–5 month old children who are being exclusively breastfed could stop before they turn 6 months old. This apparent discrepancy could be because of: (1) more recall bias for older children, and/or (2) different rates of exclusive breastfeeding across different cohorts in our sample.

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**FIGURE 8.25 EXCLUSIVE BREASTFEEDING, AS REPORTED BY MOTHERS OF 0–35 MONTH OLDS**

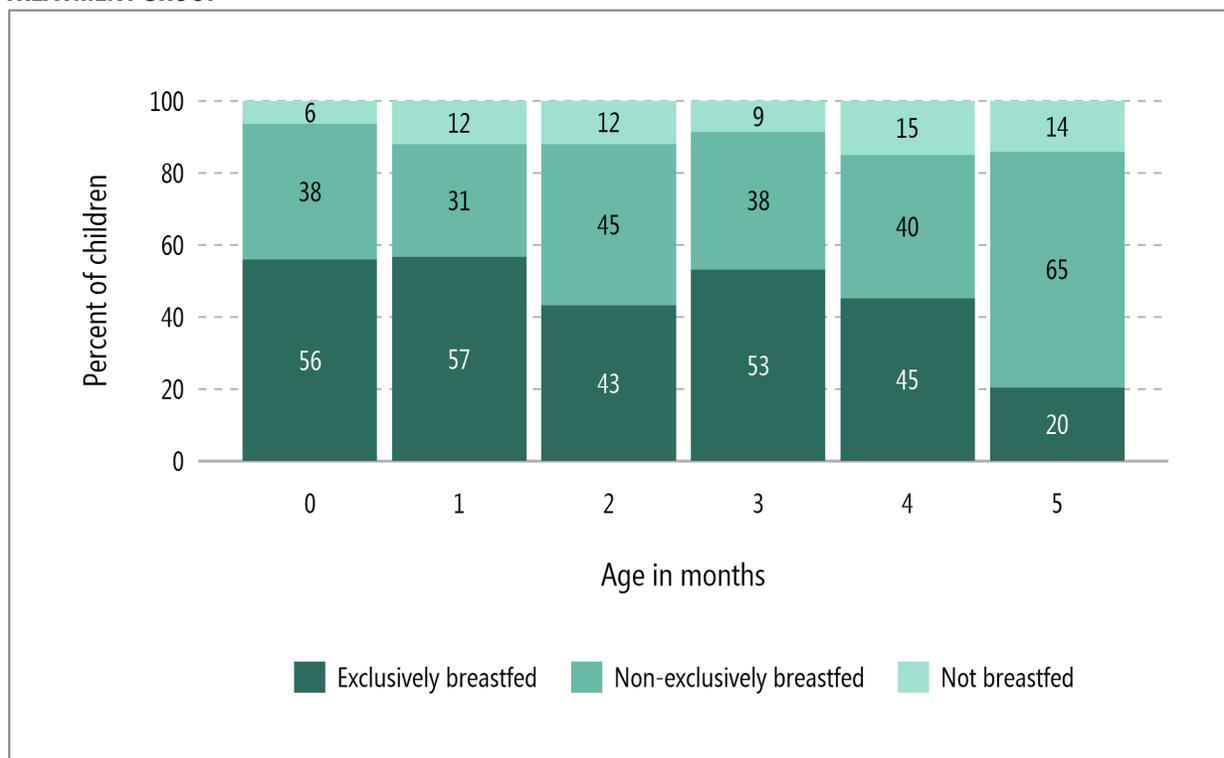


Source: Caregiver baseline and endline surveys

Sample size: 1,488–1,490 caregivers of 0-5 month olds; 7,624 caregivers of 6–35 month olds

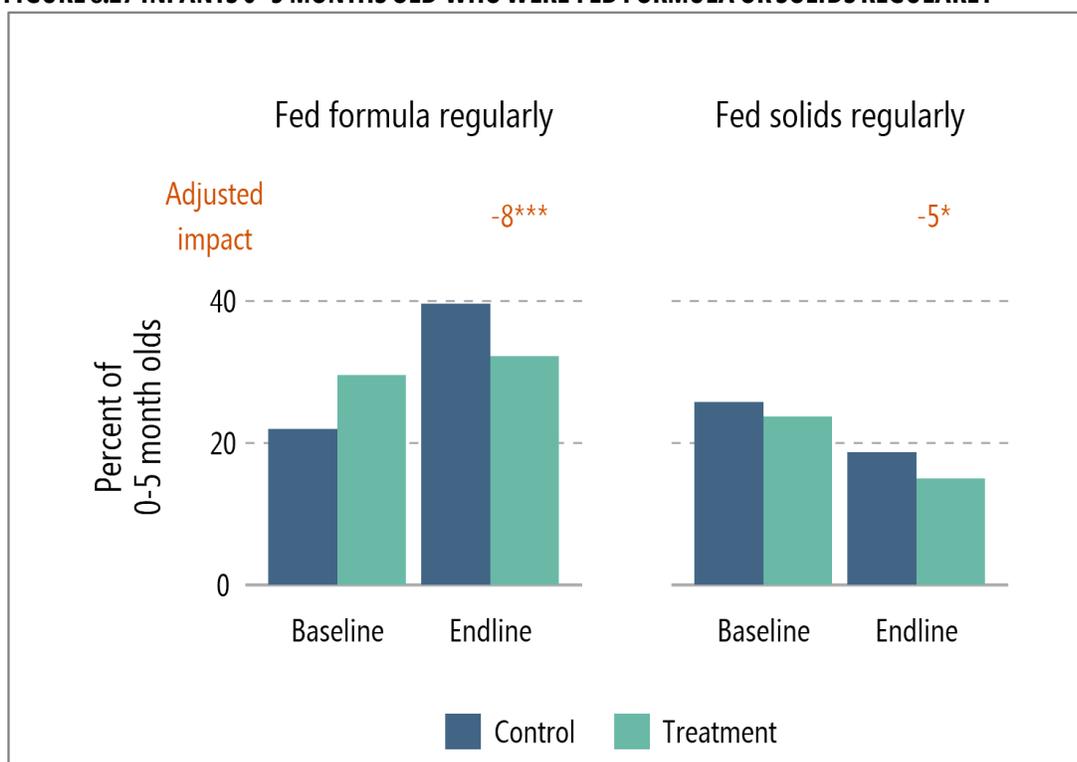
\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**FIGURE 8.26 EXCLUSIVE BREASTFEEDING BY AGE, AS REPORTED BY MOTHERS OF 0–5 MONTH OLDS IN THE TREATMENT GROUP**



Source: Caregiver endline surveys  
Sample size: 1,490 caregivers

**Formula feeding was common under 6 months of age, but the Project reduced the prevalence of regular formula feeding and the premature introduction of solid foods.** Sixty-one percent of children 0–5 months old in the treatment group had ever received formula, and there was no statistically significant difference with the control group. About half of these children (32 percent of the total) were fed formula regularly, a statistically significant 8 percentage points lower than the control group (Figure 8.27). This is consistent with the positive impacts on predominant breastfeeding described above, because formula is likely to be the main substitute for breastmilk.

**FIGURE 8.27 INFANTS 0–5 MONTHS OLD WHO WERE FED FORMULA OR SOLIDS REGULARLY**

Source: Caregiver baseline and endline surveys

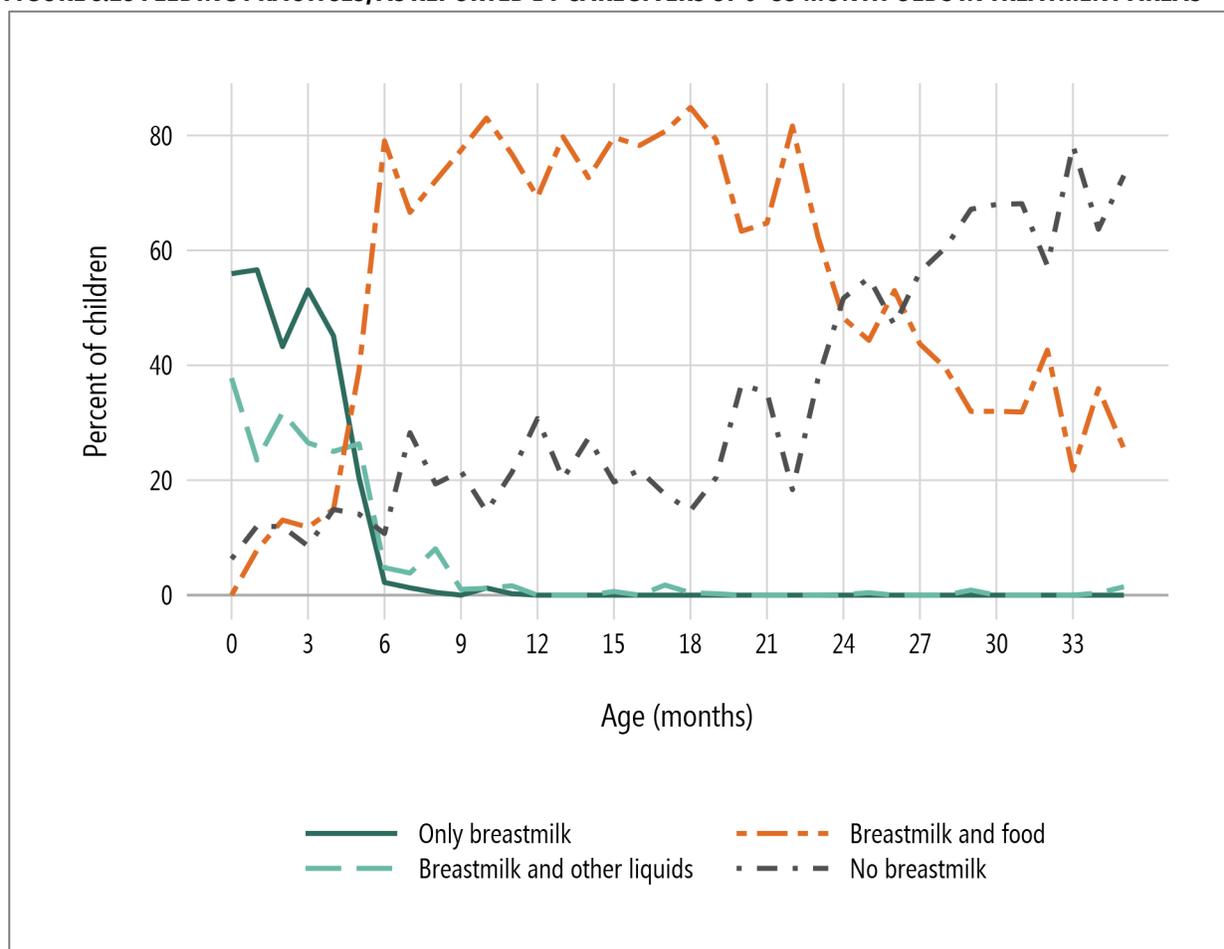
Sample size: 515 caregivers (baseline), 1,490 caregivers (endline)

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

The lack of exclusive breastfeeding was not driven by formula use alone, but also by children being given solid foods too early. Nineteen percent of 0–5 month olds in the treatment group were given solids during the previous day, a statistically significant 7 percentage points lower than in the control group. Most of these children (15 percent of the total) received solid foods regularly, a marginally statistically significant 5 percentage points lower than in the control group.<sup>64</sup> Overall, these findings suggest that the Project made modest progress in delaying the introduction of solids until the appropriate time, which may have contributed to the positive impacts on exclusive breastfeeding.

Figure 8.28 shows the overall pattern of child feeding by age in the treatment group. As shown earlier, exclusive breastfeeding rates began at about 60 percent for newborns but declined sharply after age 3 months. This pattern was mainly driven by an increase in the percent of children receiving complementary solid foods before the recommended age of 6 months rather than in increase in receiving other liquids. Nevertheless, the vast majority of children continued to receive at least some breastmilk even beyond age 18 months; by age 24 months, about 40 percent were still being breastfed.

<sup>64</sup> About one-third of children who received other liquids besides breastmilk regularly also received solid foods regularly.

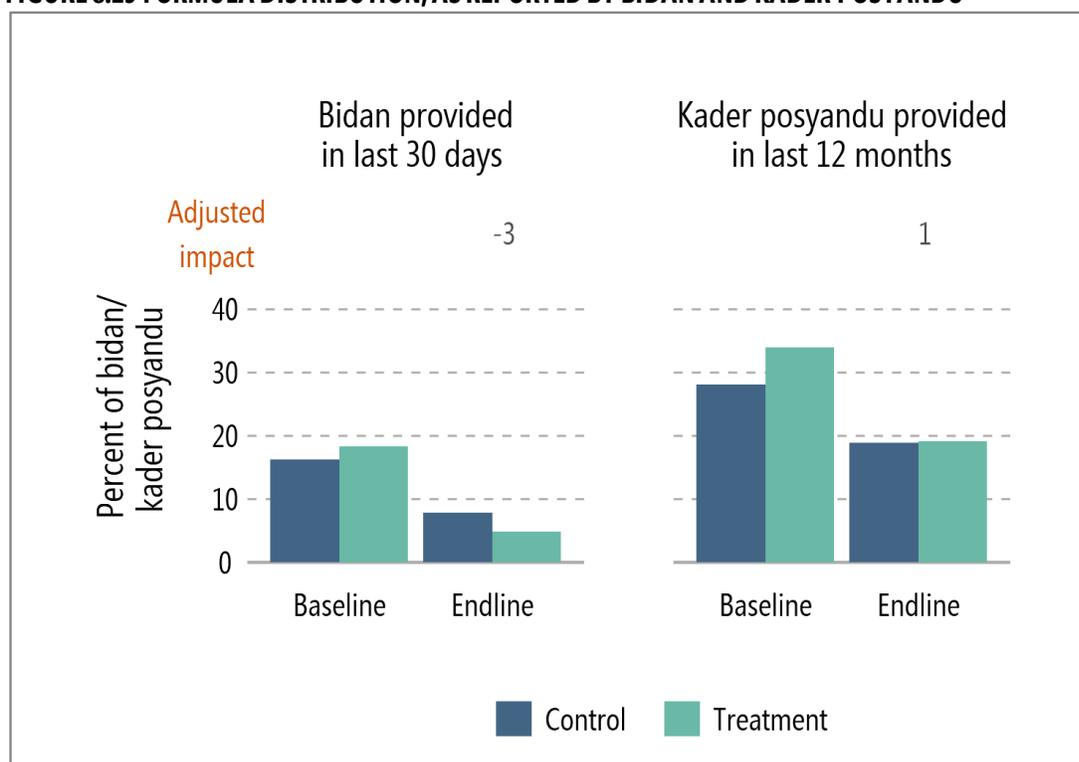
**FIGURE 8.28 FEEDING PRACTICES, AS REPORTED BY CAREGIVERS OF 0–35 MONTH OLDS IN TREATMENT AREAS**

Source: Caregiver endline surveys

Sample size: 4,558 caregivers

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**There was a large decline in health providers distributing formula between baseline and endline.** At endline, only about 5 percent of bidan in treatment areas reported providing women formula in the previous 30 days and only about 19 percent of kader posyandu reported that the posyandu provided formula in the previous year, representing a decrease of 13 and 15 percentage points from baseline, respectively (Figure 8.29). However, these decreases were similar in the treatment and control groups, and therefore cannot explain the impacts on infants receiving formula regularly (discussed above). Further, the decreases in provision of formula between baseline and endline were not reflected in an equivalent decrease in infants having ever been given formula, suggesting that caregivers obtained formula from other sources instead.

**FIGURE 8.29 FORMULA DISTRIBUTION, AS REPORTED BY BIDAN AND KADER POSYANDU**

Source: Bidan and kader posyandu baseline and endline surveys

Sample size: 569 bidan (baseline), 783 bidan (endline); 732 kader posyandu (baseline), 898 kader posyandu (endline)

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**The vast majority of providers discussed breastfeeding with their clients, but the Project only affected the likelihood of discussions by kader posyandu.** Nearly all bidan reported having discussing breastfeeding with mothers in the previous six months (as well as helping mothers breastfeed in the previous 30 days),<sup>65</sup> as did the vast majority of bidan coordinators (91 percent in treatment areas) and nutritionists (78 percent in treatment areas). These percentages were similar in treatment and control areas. Seventy-six percent of kader posyandu in treatment areas reported these discussions, a statistically significant 7 percentage points higher than those in the control areas. This kader posyandu measure was also substantially higher than at baseline, even in the control group (an increase of 11 percentage points). Overall, these findings suggest that kader posyandu were becoming more involved in breastfeeding promotion more broadly, but the Project improved this even further.

**The Project had little impact on bidan, bidan coordinators, and nutritionists discussing topics related to breastfeeding with mothers of children 0–5 months.** Across bidan, bidan coordinators, and nutritionists who discussed breastfeeding with mothers of children 0–5 month

<sup>65</sup> Only about 4 percent of women who received a prenatal checkup from a bidan reported receiving a advice about feeding the baby during those checkups, suggesting that bidan are primarily giving breastfeeding a advice after the child is born.

olds, exclusive breastfeeding was by far the most common topic discussed in the treatment and control groups. These providers discussed exclusive breastfeeding at similar rates except for bidan coordinators, who were 9 percentage points more likely to discuss it in the treatment group (a marginally statistically significant difference). Another common topic was breastfeeding frequency; and bidan, bidan coordinators, and nutritionists in the treatment group were more likely to discuss this topic than those in the control group by 7, 11, and 8 percentage points, respectively (these differences were statistically significant among bidan and bidan coordinators and only marginally significant among nutritionists). However, overall there were few statistically significant impacts on the breastfeeding topics providers discussed with mothers. Therefore, changes in the prevalence of discussion of these topics are likely insufficient to explain the changes in breastfeeding, regular use of formula, and premature introduction of solid foods described above. Instead, these impacts are likely due to other mechanisms, such as improved behavior change messaging on the part of providers or Generasi messaging around breastfeeding.

### 8.6.2 Complementary feeding

In addition to the breastfeeding recommendations discussed above, the WHO and UNICEF suggest that breastfeeding take place “together with safe, nutritionally adequate, age appropriate, responsive complementary feeding starting in the sixth month” (UNICEF 2015; WHO 2018a).<sup>66</sup> Complementary feeding starts at 6 months of age because it is around that time that breastmilk alone cannot meet infants’ nutrient needs (Agostoni et al. 2008; WHO 2018a).

The UNICEF and WHO minimum acceptable diet indicator combines standards of dietary diversity and feeding frequency. They recommend a diet that includes at least four of the seven food groups a day to ensure adequate growth (WHO 2008; Arimond and Ruel 2004).<sup>67</sup> The recommended meal frequency depends on the age of the child and whether or not they are also being breastfed.<sup>68</sup> The minimum acceptable diet indicator thus provides a useful way to track progress at simultaneously improving the key quality and quantity dimensions of children’s diets. A secondary analysis of Demographic and Health Surveys data in 21 countries found that dietary diversity was more strongly associated with length-for-age z-scores than meal frequency or overall adequate diet (combining diversity and frequency), suggesting that increasing dietary diversity has the greatest potential to improve linear growth (Onyango et al. 2014).

The Project envisioned that it would affect complementary feeding in largely the same way it would affect breastfeeding—through the training, one-on-one counseling sessions, nutritional counseling sessions, and the posyandu. For children who were identified as underweight or

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<sup>66</sup> Feeding between 6 and 23 months old is defined as complementary because food at this age complements a diet that also relies heavily on breastmilk.

<sup>67</sup> The UNICEF/WHO (2008) guide names seven food groups: (1) grains, roots and tubers; (2) legumes and nuts; (3) dairy products (milk, yogurt, cheese); (4) flesh foods (meat, fish, poultry and liver/organ meats); (5) eggs; (6) vitamin-A rich fruits and vegetables; and (7) other fruits and vegetables.

<sup>68</sup> The recommended minimum daily meal frequency is two times for breastfed infants 6–8 months old, three times for breastfed children 9–23 months old, and four times for non-breastfed children 6–23 months old (WHO 2008).

stunted, or for pregnant women with chronic energy deficiency, PMT—funded through Generasi—was another mechanism for providing supplementary food.<sup>69</sup> (We discuss PMT in-depth in Section 8.7 below.)

Detailed results for this section are in Appendix B Tables 8.47–8.49 (all UNICEF/WHO indicators in these tables are marked with ).

**The vast majority of children over 6 months were given complementary foods, as recommended, in both the treatment and control groups.** Nearly all 6–8 month olds in the treatment group (92 percent) received solid, semi-solid, or soft foods during the previous day. This percentage was very similar in the control group, suggesting that complementary feeding of children over 6 months old was common and not affected by the Project. (As shown above, solids were introduced too early for about one-fifth of children, and the Project slightly reduced this.)

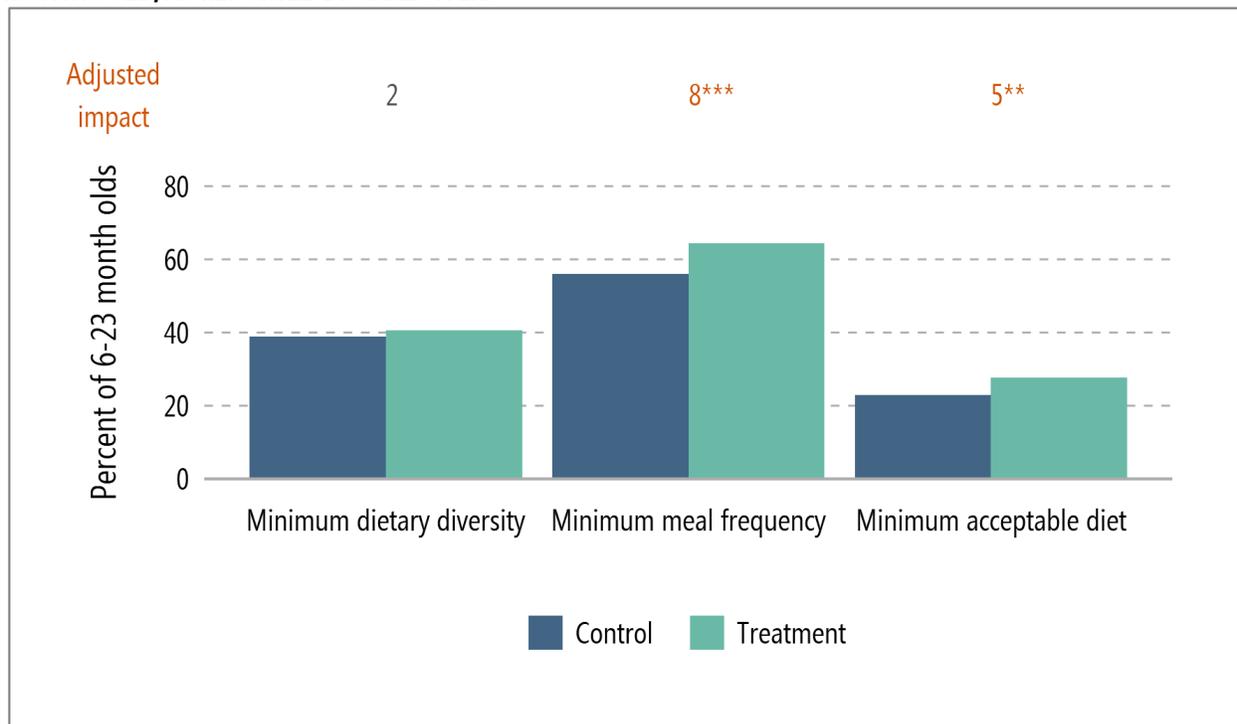
**At endline, almost three-quarters of children did not consume the minimum acceptable diet, despite positive impacts of the Project on meal frequency.** At endline, only about 41 percent of children 6–23 months old in the treatment group received the recommended dietary diversity in the previous day, defined as consuming foods from at least four of the seven recommended food groups (Figure 8.30). Only about 64 percent received the minimum recommended meal frequency, which depends on age and breastfeeding status. Minimum dietary diversity was similar to the control group, but minimum meal frequency was a statistically significant 8 percentage points higher in the treatment group. Subgroup analysis suggests that the impact on minimum frequency was largest in South Sumatra (16 percentage points) and for female children (12 percentage points). Only about 28 percent of children in this age group met the criterion for minimum acceptable diet, which combines the dietary diversity and meal frequency indicators. This was a statistically significant 5 percentage points higher in the treatment group than the control group, driven by the impacts on meal frequency.

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<sup>69</sup> Chronic energy deficiency (CED) is defined as having a low body mass index (BMI < 18.5) (James et al. 1988).

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**FIGURE 8.30 MINIMUM DIETARY DIVERSITY, FEEDING FREQUENCY, AND ACCEPTABLE DIET FOR CHILDREN 6–23 MONTHS OLD, AS REPORTED BY CAREGIVERS**



Source: Caregiver baseline and endline surveys

Sample size: 3,115 caregivers

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**Most providers discussed complementary feeding with caregivers, but there were some treatment-control differences in the content and frequency of discussions.** About 77 percent of nutritionists in treatment areas reported discussing complementary feeding with mothers of 6–23 month olds in the previous 30 days, similar to the rate in the control group. The type of food, quantity of food, and frequency of feeding were the most common topics discussed by nutritionists. Consistent with the findings on meal frequency above, this topic was substantially more likely to be discussed in treatment areas (by a statistically significant 15 percentage points). About 94 percent of bidan and 86 percent of kader posyandu in treatment areas reported discussing complementary feeding with mothers of children under 5 years old in the previous six months. For bidan this was similar to control areas, but for kader posyandu it was a statistically significant 8 percentage points higher. (We did not ask about specific topics discussed by bidan and kader posyandu.)

## 8.7 Undernutrition prevention activities

The Nutrition Project sought to prevent and treat undernutrition<sup>70</sup> in several ways: (1) incentivizing growth monitoring at the posyandu by including weight checks as Generasi indicators (separate indicators for children 0–5 and 0–23 months old);<sup>71</sup> (2) training puskesmas staff—mainly nutritionists and bidan coordinators—on growth monitoring; (3) providing portable length taking equipment to puskesmas that could be easily transported to posyandu sessions; and (4) providing Generasi funding, which communities could decide to spend on PMT, in-kind supplementary food for children under 5 identified as stunted or underweight provided through the posyandu. In this section we discuss results related to these four efforts. Detailed results are in Appendix B Tables 8.50–8.57.

### 8.7.1 Weighing and length taking

Regular growth monitoring has the potential to contribute to preventing and treating undernutrition (Ashworth et al. 2008). As mentioned above, one of the posyandu’s main functions is to offer a venue for monthly weighing, among other services. The KMS, a growth chart that is included in the buku KIA, is the primary tool for monitoring growth and allows providers to record a child’s weight monthly up to 60 months old and to easily compare the child’s weight and weight gain to the recommended minimums for healthy growth (shown in Figure 8.31). According to the KMS, caregivers are supposed to report to “health officers” (the KMS does not mention specific types of health providers) if the child’s weight does not increase as recommended in the chart. Length taking occurs less frequently; there is a page in the buku KIA dedicated to length measurement with space for noting length every three months up to 24 months old and then every six months up to 60 months old (shown in Box 8.1). Not every posyandu offers length taking, but it is supposed to be available at every puskesmas.

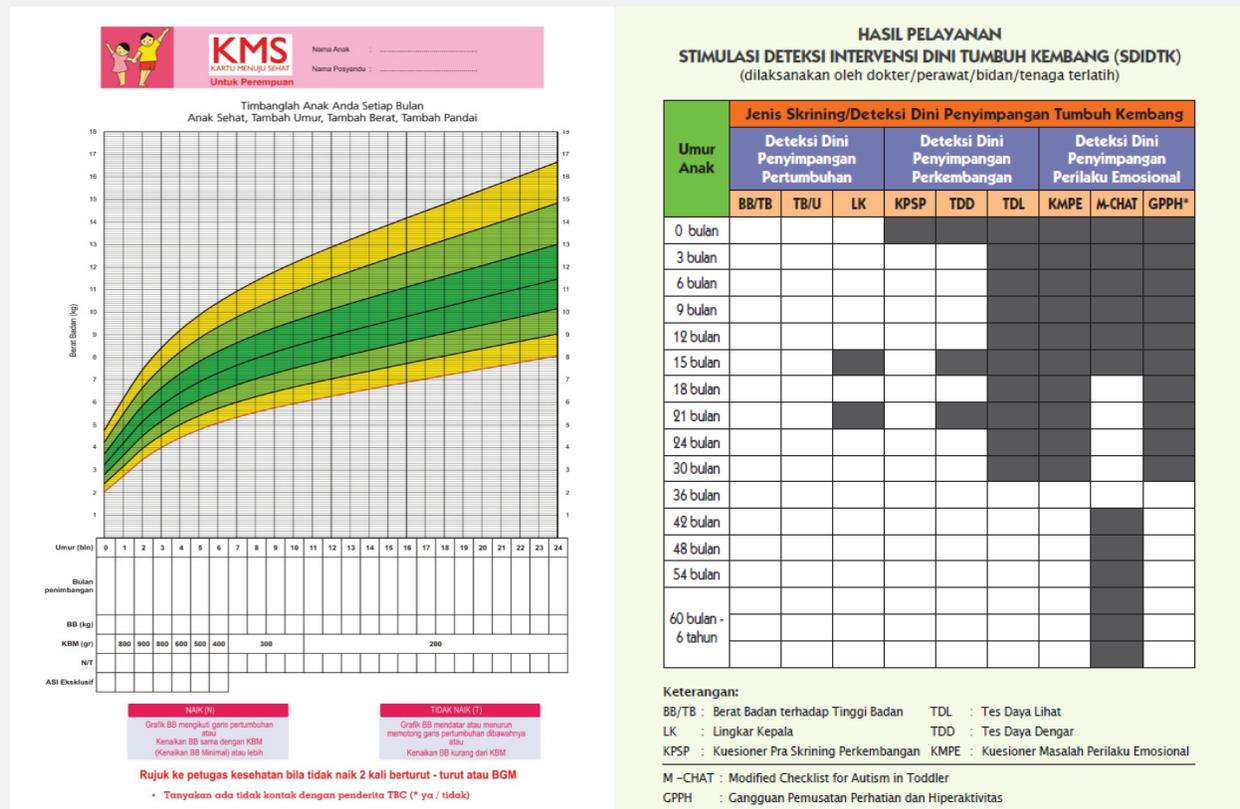
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<sup>70</sup> In this chapter we use this general term “undernutrition” to include wasting, stunting, underweight, and vitamin or mineral deficiencies, following the WHO (2018b) definition.

<sup>71</sup> The two Generasi indicators are: number of children 0–5 months weighed monthly in last three months, and number of children 0–23 months weighed monthly and gained weight in the last three months. We interpret this to mean an appropriate weight increase according to the KMS. We did not collect data on the weight recorded every month in the KMS, so we can only report on weighing frequency over the last year, not the percent of children who experienced a weight increase.

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**BOX 8.1 KMS GROWTH CHART (LEFT) AND LENGTH MEASUREMENT RECORD (RIGHT)**

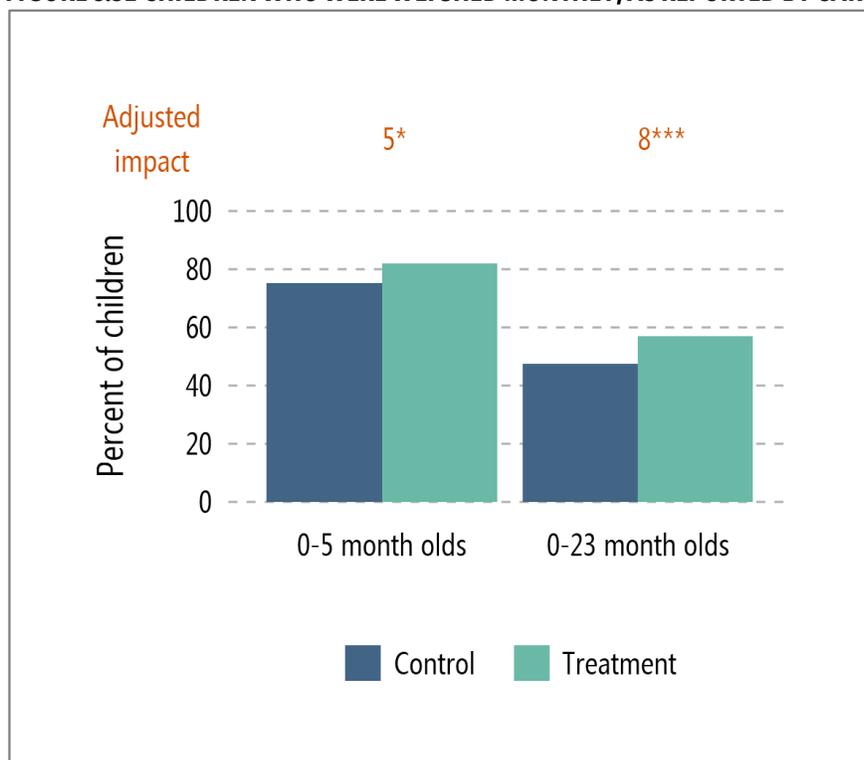


Source: Buku KIA, Indonesia Ministry of Health

Note: In the KMS, y-axis is the kg and x-axis is months. If a child's weight falls below the red line in the KMS, he/she should be referred to the puskesmas for treatment. For the other page, the first four columns are from left to right: age in months, weight for length, length for age, and head circumference.

Below, we look at whether posyandu offered growth monitoring services as intended, and the extent to which children received them.

**More than three-quarters of 0–5 month olds and more than half of 0–23 month olds were weighed monthly; the Project modestly increased the likelihood of monthly weighing.** The vast majority of children in the treatment group—98 percent of 0–11 month olds and 93 percent of 12–35 month olds—were weighed at least once in the last year. For 0–11 month olds, this percentage was similar to the control group, but for 12–35 month olds it was slightly higher, by a statistically significant 3 percentage points. The frequency of weighing was also slightly higher for 12–35 month olds in the treatment group, by a statistically significant 0.9 times per year. (The average was more than 8 times per year.) Looking at the Generasi indicators, about 82 percent of 0–5 month olds and 57 percent of 0–23 month olds in the treatment group were weighed monthly. These were a marginally statistically significant 5 percentage points and a statistically significant 8 percentage points higher than in the control group, respectively (Figure 8.31).

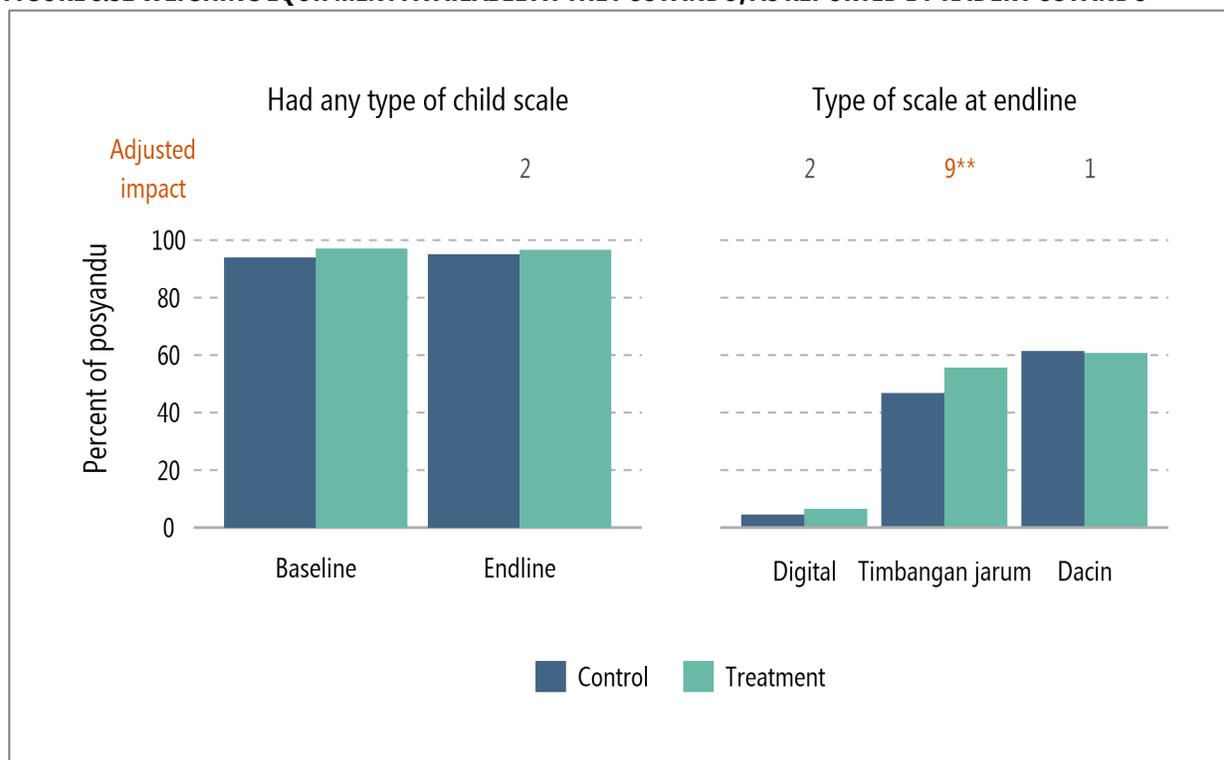
**FIGURE 8.31 CHILDREN WHO WERE WEIGHED MONTHLY, AS REPORTED BY CAREGIVERS**

Source: Caregiver endline surveys

Sample size: 1,490 caregivers of 0–5 month olds, 4,599 caregivers of 0–23 month olds

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**Almost all posyandu conducted weight measurements and had a functioning scale, but the Project affected the type of scale available.** Almost all posyandu in treatment and control areas conducted weight measurement the last time the posyandu was in session and nearly all posyandu had a functioning scale for measuring weight (Figure 8.32). Posyandu in treatment areas were a statistically significant 9 percentage points more likely to have an analog hanging scale (in Indonesian known as *timbangan jarum*), but no more likely to have a digital scale or balance scale (in Indonesian known as *dacin*) than posyandu in control areas (these scales are illustrated in Box 8.2). (The digital scale is the highest-quality option, but very few posyandu have access to these scales; it is unclear which of the other types of scales are better than others.)

**FIGURE 8.32 WEIGHING EQUIPMENT AVAILABLE AT THE POSYANDU, AS REPORTED BY KADER POSYANDU**

Source: Kader posyandu baseline and endline surveys

Sample size: 760 kader posyandu (left panel, baseline), 898 kader posyandu (left panel, endline); 714 kader posyandu (right panel, baseline), 849 kader posyandu (right panel, endline)

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

### BOX 8.2 TYPES OF HANGING SCALES USED AT POSYANDU— TIMBANGAN JARUM AND DACIN

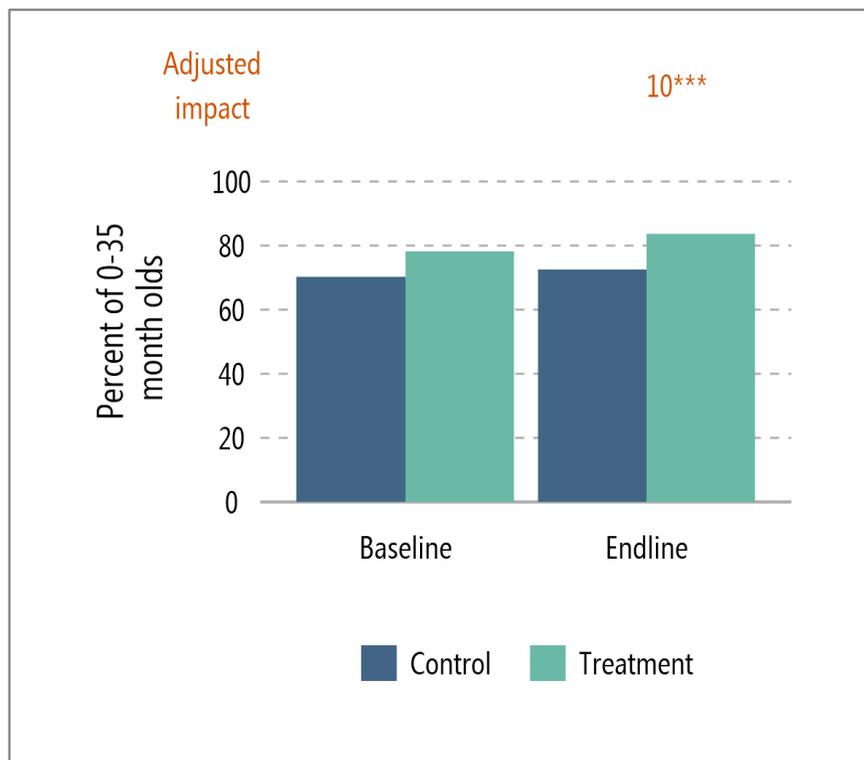


Source: Timbangan Budi (left) and Mohamad Rosihan (right)

**Most children were weighed at the posyandu and children in treatment areas were more likely to be weighed there than those in control areas.** Eighty-four percent of children in the treatment group who were weighed in the last year were most recently weighed at the posyandu, a statistically significant 10 percentage points higher than in the control group (Figure 8.33). This suggests that the Project shifted the venue for weighing for some households, even though the effect on the frequency of weighing was limited, as shown above. While the posyandu was the most common location for weighing across treatment and control groups, in the control group

bidan's private practice, doctor's office, and hospital were more common compared to the treatment group.

**FIGURE 8.33 MOST RECENT WEIGHT MEASUREMENT AT THE POSYANDU AMONG CHILDREN WEIGHED, AS REPORTED BY CAREGIVERS OF 0–35 MONTH OLDS**



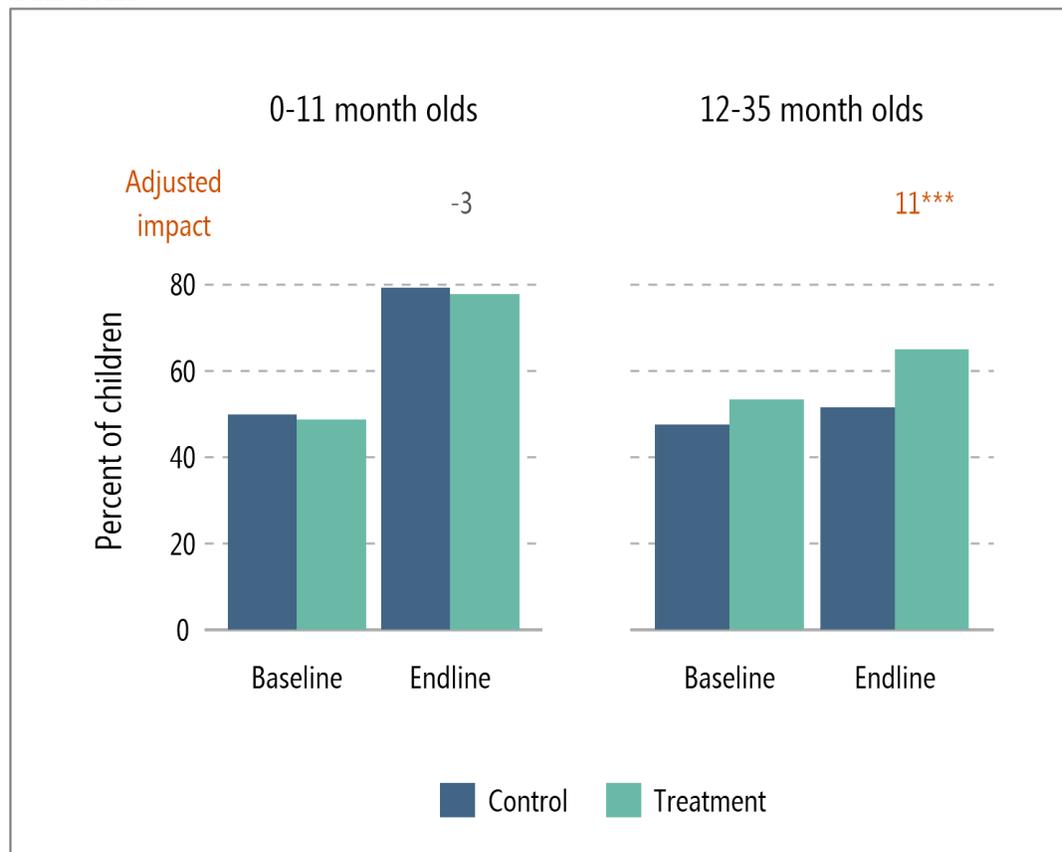
Source: Caregiver baseline and endline surveys

Sample size: 2,886 caregivers (baseline), 8,847 caregivers (endline)

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**The Project had an impact on the likelihood of having length measured for 12–35 month olds but not 0–11 month olds.**<sup>72</sup> Seventy-eight percent of 0–11 month olds and 65 percent of 12–35 month olds in the treatment group had their length taken in the last year (Figure 8.34). For 0–11 month olds, this percentage was similar to the control group, although there was a large increase since baseline in both groups (29 percentage points in the control group.). For 12–35 months old, this measure was a statistically significant 11 percentage points higher than in the control group, and there was little change since baseline in the control group. On average, 12–35 month olds in the treatment group who had their length taken in the last year were measured six times, slightly higher than in the control group (0.8 times, statistically significant). This frequency is much higher than the recommended frequency in the buku KIA that was mentioned above.

<sup>72</sup> The WHO guidance is that children are measured lying down until 2 years and standing up afterwards. Hereafter we use the term “length taking” to refer to both of these measurements.

**FIGURE 8.34 CHILDREN WHO HAD THEIR LENGTH MEASURED IN THE PREVIOUS YEAR, AS REPORTED BY CAREGIVERS**

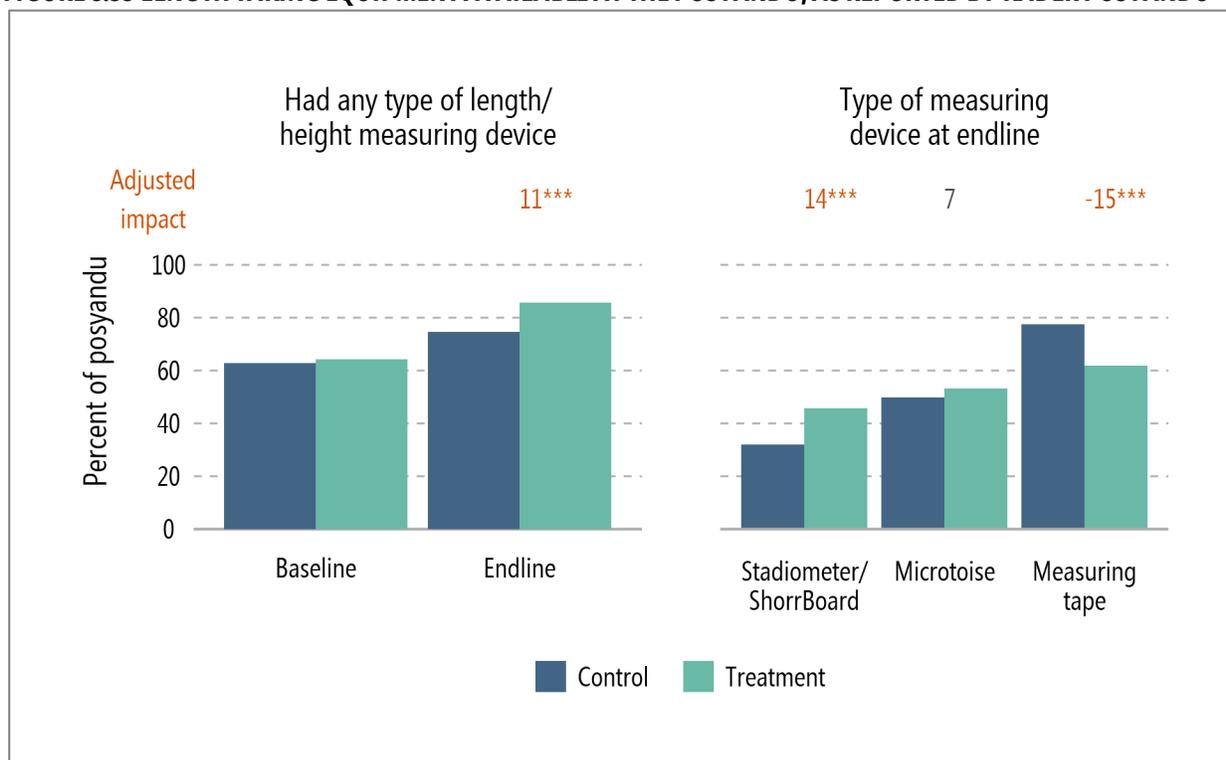
Source: Caregiver baseline and endline surveys

Sample size: 1,040 caregivers of 0–11 month olds (baseline), 3,051 caregivers of 0–11 month olds (endline); 1,154 caregivers of 12–35 month olds (baseline), 6,039 caregivers of 12–35 month olds (endline)

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**The Project did not affect whether posyandu offered length taking services, but posyandu in treatment areas were more likely to have length measurement devices.** Sixty-six percent of posyandu in the treatment group conducted length taking the last time the posyandu was in session. This was almost double the rate at baseline, but similar to the rate in the control group, which experienced a similar increase. Eighty-six percent of posyandu in the treatment group had any kind of operational length taking device, a statistically significant 11 percentage points more than in the control group (Figure 8.35). (Even in the control group, this had increased by 12 percentage points from baseline.) Treatment posyandu were significantly less likely to have a measuring tape, considered a lower-quality measurement tool, and significantly more likely to have a ShorrBoard or stadiometer, equally high-quality devices. (This difference was driven by the difference in having a ShorrBoard.) They were similarly likely to have a microtoise, a high-quality device for measuring standing height as control posyandu. (The ShorrBoard and stadiometer are illustrated in Box 8.3.)

**FIGURE 8.35 LENGTH TAKING EQUIPMENT AVAILABLE AT THE POSYANDU, AS REPORTED BY KADER POSYANDU**



Source: Kader posyandu baseline and endline surveys  
 Sample size: 760 kader posyandu (left panel, baseline), 898 kader posyandu (left panel, endline); 464 kader posyandu (right panel, baseline), 720 kader posyandu (right panel, endline)  
 \* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**BOX 8.3 SHORRBOARD AND STADIOMETER USED BY POSYANDU**

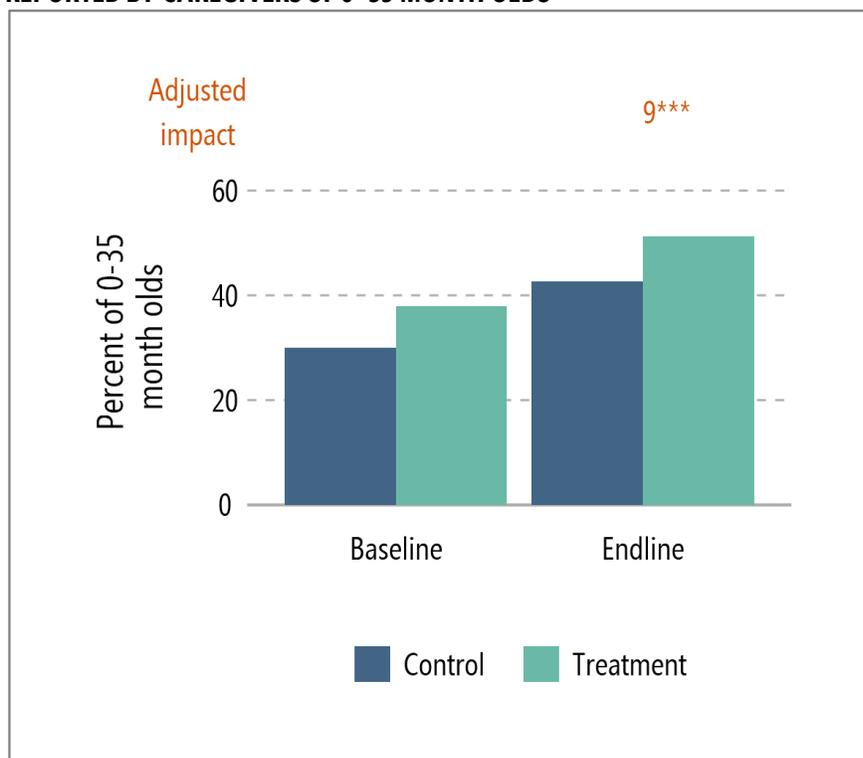


Source: SurveyMETER

### Children in Project areas were more likely to be measured for length at the posyandu.

Among children who were measured for length in the last year, 51 percent in the treatment group were measured at the posyandu, a statistically significant 9 percentage points higher than in the control group (Figure 8.36). In addition, kader posyandu in treatment areas were a statistically significant 6 percentage points more likely to discuss length taking with pregnant women and caregivers over the last six months. It is possible that this promotion encouraged length taking at the posyandu.

**FIGURE 8.36 MOST RECENT LENGTH MEASUREMENT AT THE POSYANDU AMONG CHILDREN MEASURED, AS REPORTED BY CAREGIVERS OF 0–35 MONTH OLDS**



Source: Caregiver baseline and endline surveys

Sample size: 1,630 caregivers (baseline), 2,756 caregivers (endline)

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

### 8.7.2 Undernutrition diagnosis and treatment

Growth monitoring is just a first step in undernutrition prevention and treatment. The next step is for health officers to inform parents that a child is stunted, wasted, or underweight and advise them on treatment. In this section we look at whether households received such information and whether and how providers treated undernourished children.<sup>73</sup>

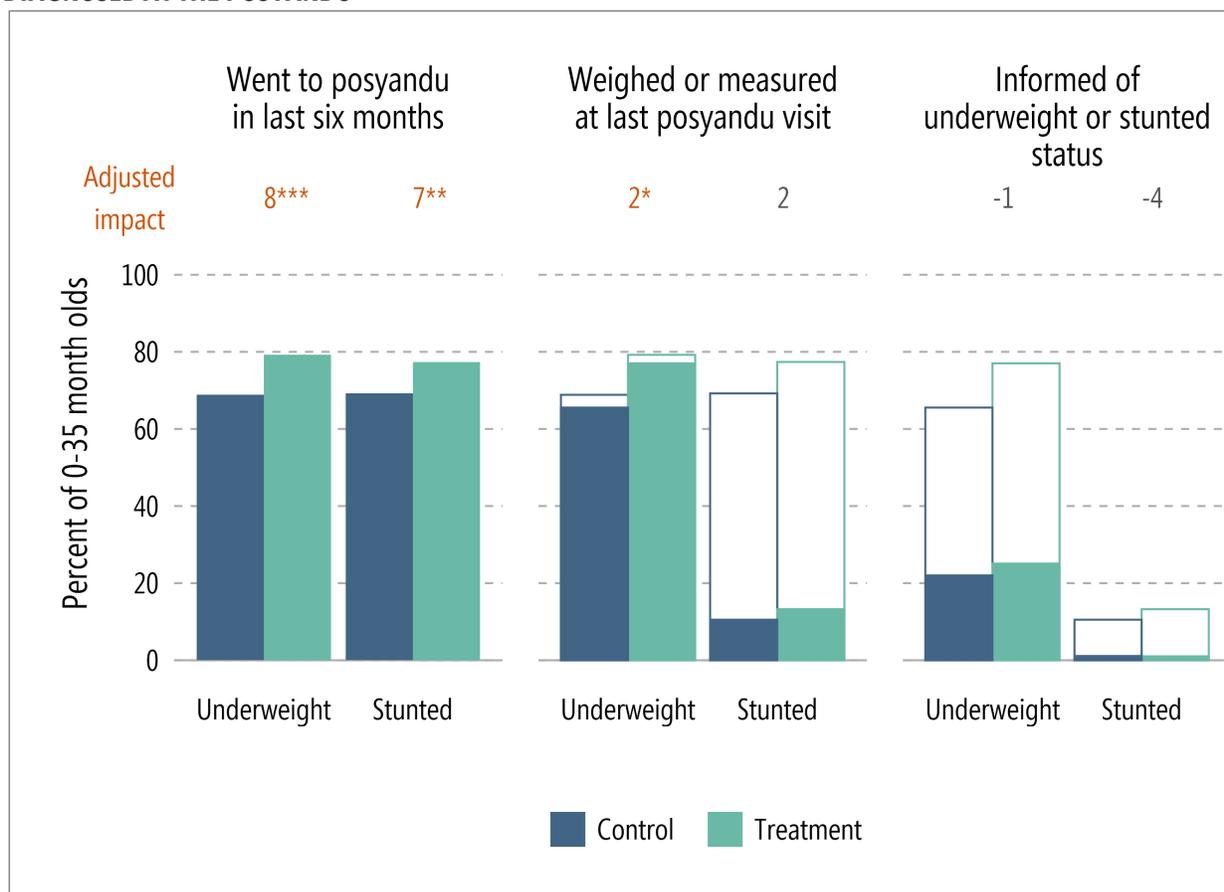
<sup>73</sup> There is substantial evidence that catch-up growth for stunted children is possible and that stunting is not completely irreversible (Schott et al. 2019; Martorell et al. 1994; Prentice et al. 2013; Cameron 2005; Shrimpton 2001; Golden 1994; Walker 1996; Victora et al. 2008). However, there is a lack of consensus on the timing of

**Only a small share of stunted and underweight children were diagnosed as such at the posyandu, and the Project had no effect on diagnosis.** About three-quarters of children in the treatment group we identified as stunted or underweight (using anthropometric measurements from the survey data collection) had been to the posyandu in the last six months. About 17 percent of the stunted children had their length measured at the last posyandu visit, but in only 8 percent of those cases were their caregivers told by a health officer that the child was stunted (Figure 8.37). Almost all underweight children were weighed at the last posyandu visit, but in only 33 percent of those cases were their caregivers told that the child was underweight.<sup>74</sup> These measures were similar in the treatment and control groups. This suggests that providers may be taking incorrect measurements, were not interpreting these measurements as they were expected to, or were not communicating the results to caregivers. (A caveat to this analysis is that children’s nutritional status might have changed between when they last went to the posyandu—up to six months before the endline survey—and had their anthropometric measurements taken as part of the endline survey. Nevertheless, nutritional status is likely to be correlated over the period of a few months, especially for stunting.)

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childhood nutritional interventions to promote catch-up growth and disagreement on the magnitude of the effects of such interventions on height-for-age z-scores. As mentioned in Chapter 2, the only proven method to treat stunting is providing LNS (Hess et al. 2015; Mangani et al. 2016; Adu-Afarwuah et al. 2007; Phuka et al. 2007, 2008). Nevertheless, identifying stunted children could be important to prevent children from falling farther away from a healthy growth trajectory through improved nutrition.

<sup>74</sup> We also collected data from caregivers of children with a stunting or underweight diagnosis on what providers told them to do to improve the child’s condition, but we do not report these results because the sample sizes are small.

**FIGURE 8.37 SHARE OF STUNTED AND UNDERWEIGHT CHILDREN WHO WERE MEASURED AND WEIGHED, AND DIAGNOSED AT THE POSYANDU**

Source: Caregiver endline surveys

Sample size: 754 caregivers of underweight children and 1,041 caregivers of stunted children

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**Providers in Project areas were more likely to discuss stunting with caregivers, and bidan coordinators in Project areas were more likely to see stunting treatment as a job responsibility.** Bidan and kader posyandu in treatment areas were a statistically significant 11 and 24 percentage points more likely, respectively, to report discussing stunting with pregnant women or caregivers of young children in the last six months compared to those in control areas. Bidan coordinators in treatment areas were more likely to report stunting treatment as their job responsibility compared to those in control areas, by a statistically significant 16 percentage points. These findings could be the result of these providers' engagement with the growth monitoring training.

**Puskesmas staff most commonly counseled parents on diet changes and provided supplementary food to treat stunting; the Project had no impact on treatment methods.** We asked bidan coordinators and nutritionists who reported treating stunting as part of their jobs (in the treatment group, this was about two-thirds of bidan coordinators and nutritionists) what type of treatment methods they used. By far the most common response across providers was counseling parents on diet changes, reported by 64 percent of bidan coordinators and 85 percent

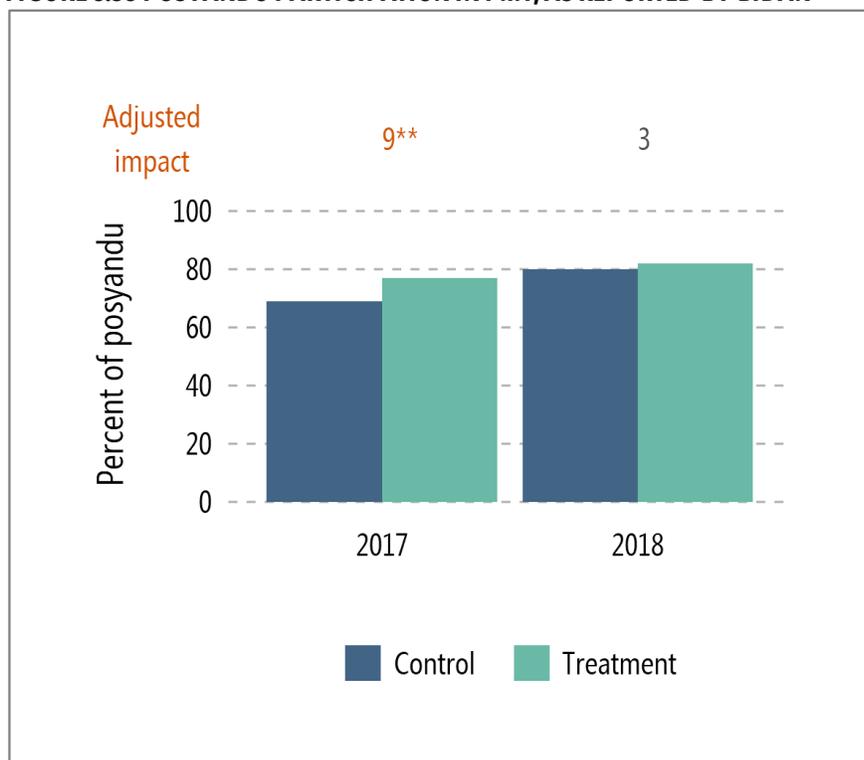
of nutritionist in the treatment group. Other common responses were providing supplementary food and counseling parents on using micronutrients. Less common responses were to admit the child to the puskesmas or to refer the child to a hospital. There was no statistically significant difference in any of these methods across treatment and control groups.

### 8.7.3 PMT receipt and characteristics

There are two main types of PMT. One comprises of snacks offered at posyandu or nutritional counseling sessions to incentivize participation. The second, often referred to as PMT *pemulihan* or recovery, comprises of fortified or unfortified supplementary food for children under 5 identified as stunted or underweight. PMT recovery is generally distributed by bidan at the posyandu but is in some cases distributed at the puskesmas. PMT recovery is a substantial amount of food—in the majority of cases, bidan in this study reported that the PMT was intended to last for 30 days. The analysis below focuses on PMT recovery, which we hereafter simply refer to as “PMT.”

As discussed in Chapter 6, PMT played a very significant part in Generasi, as the majority of Generasi funds were devoted to PMT. Here we look at the extent to which posyandu offered PMT during and after the Project ended, and whether underweight and stunted children received PMT as intended.

**Posyandu participation in PMT was increasing over time; the Project affected PMT participation in 2017 but not in later years.** In the treatment group, 77 percent of bidan reported that the posyandu they were affiliated with participated in PMT in 2017, a statistically significant 9 percentage points more than in the control group (Figure 8.38). This is when Generasi was still being fully implemented, providing funds for PMT in treatment areas. In contrast, bidan in the treatment and control groups were almost equally likely to report that the posyandu they were affiliated with participated in PMT in 2018 (82 percent in the treatment group and 80 percent in the control group). This suggests that, after the end of Generasi, posyandu in treatment and control areas were able to access PMT to a similar extent using non-Generasi funding sources (as we discuss later).

**FIGURE 8.38 POSYANDU PARTICIPATION IN PMT, AS REPORTED BY BIDAN**

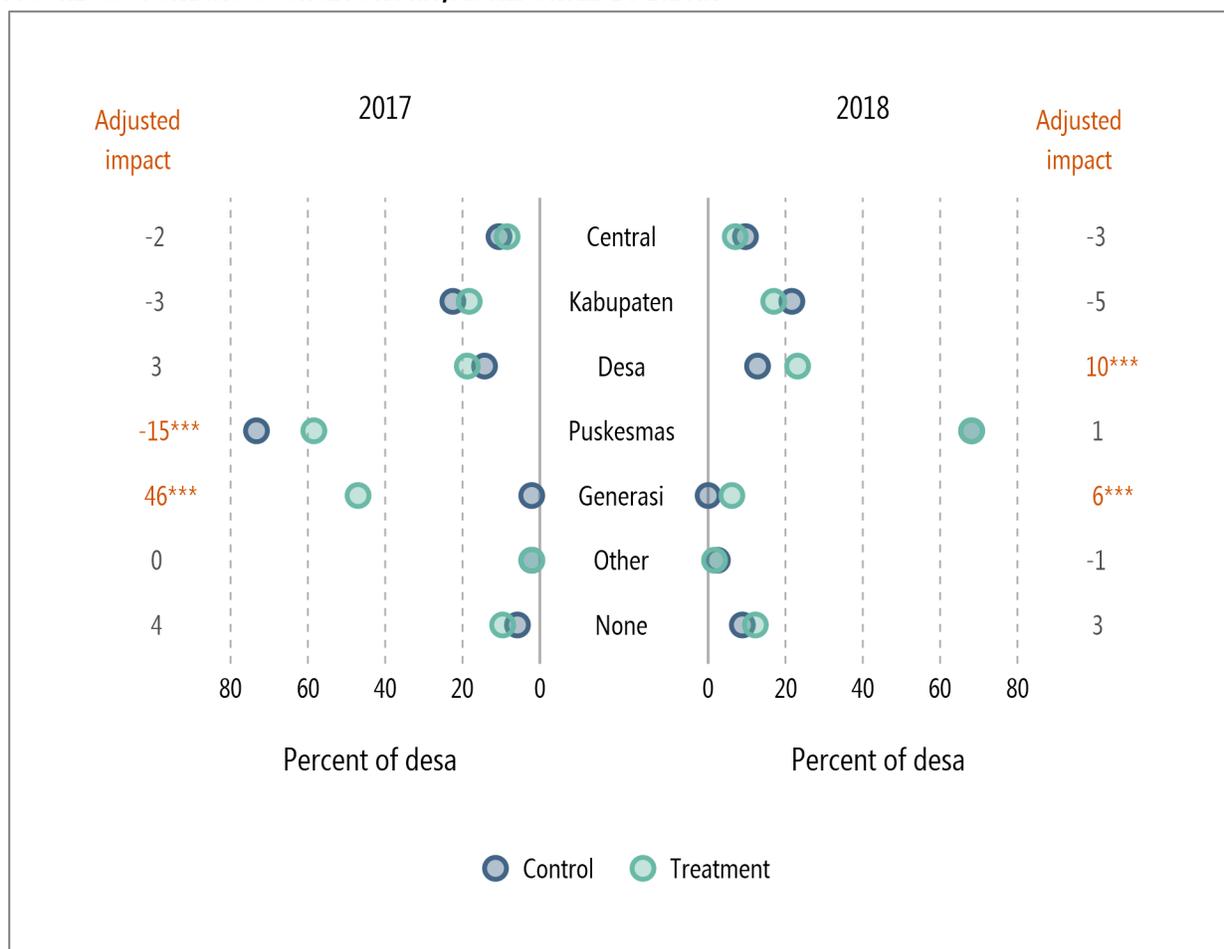
Source: Bidan endline surveys

Sample size: 778 bidan

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**Generasi shifted some of the funding burden for PMT away from the puskesmas in 2017; when Generasi ended, the desa government took over some of that funding.** In 2017, 58 percent of bidan in the treatment group reported that the puskesmas funded PMT, a statistically significant 16 percentage points lower than the control group (Figure 8.39). In the same year, 47 percent of bidan in the treatment group reported Generasi as a funding source compared to 2 percent in the control group. Other funding sources were equally likely to be reported in the treatment and control groups. This suggests that Generasi displaced funding from the puskesmas during Generasi implementation.

By 2018, Generasi was reported as a funding source by only 6 percent of bidan in the treatment group (none in the control group). The puskesmas resumed its original funding role and became a more likely funder in treatment areas in 2018 (as reported by 68 percent of bidan), similar to the situation in the control group. In addition, a higher share of bidan in the treatment group reported that the desa government was a source of funding in 2018 compared to the control group (a statistically significant difference of 10 percentage points). This suggests some sustainability of community funding of PMT—that the desa government took over some of the funding that was previously provided by Generasi.

**FIGURE 8.39 FUNDING SOURCE FOR PMT, AS REPORTED BY BIDAN**

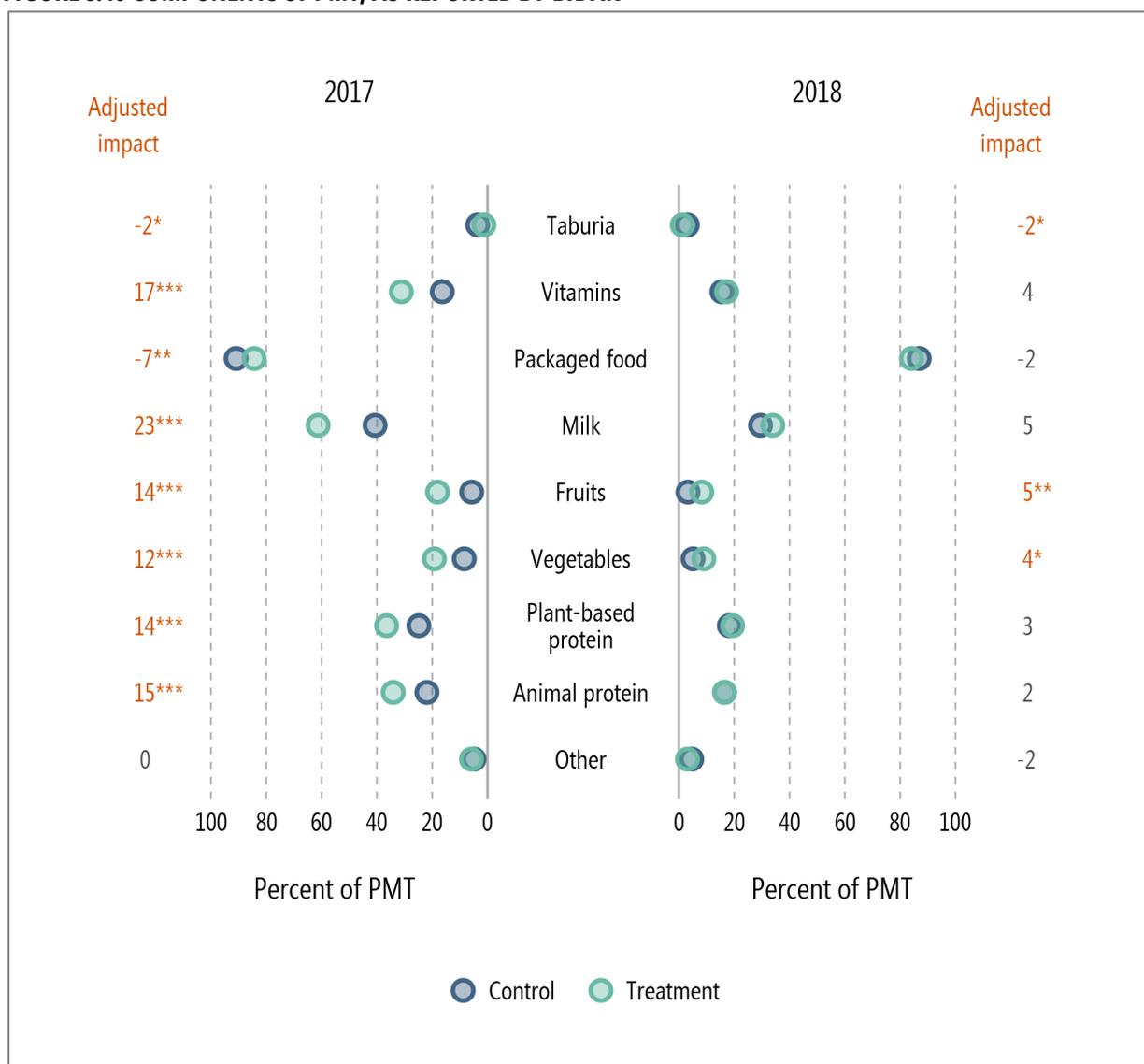
Source: Bidan endline surveys

Sample size: 560 bidan (left panel), 623 bidan (right panel)

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**There was a substantial difference between the treatment and control groups in terms of PMT components in 2017 but not in 2018, suggesting that Generasi had an effect on the quality of PMT.** By far the most common component of PMT was packaged food, followed by milk. In 2017 in the treatment group, PMT also included a high share of vitamins, plant and animal-based protein, and fruits and vegetables (Figure 8.40). There was a statistically significant difference from the control group for all of these ingredients (with packaged food being lower in the treatment group, by 7 percentage points, and most other components being higher, with differences of up to 23 percentage points). These treatment-control differences largely disappeared by 2018, with the exception of small differences for fruits and vegetables, which were still slightly more common in the treatment group. Overall, this suggests that Generasi had a temporary impact on PMT components while it was in operation.

**FIGURE 8.40 COMPONENTS OF PMT, AS REPORTED BY BIDAN**



Source: Bidan endline surveys

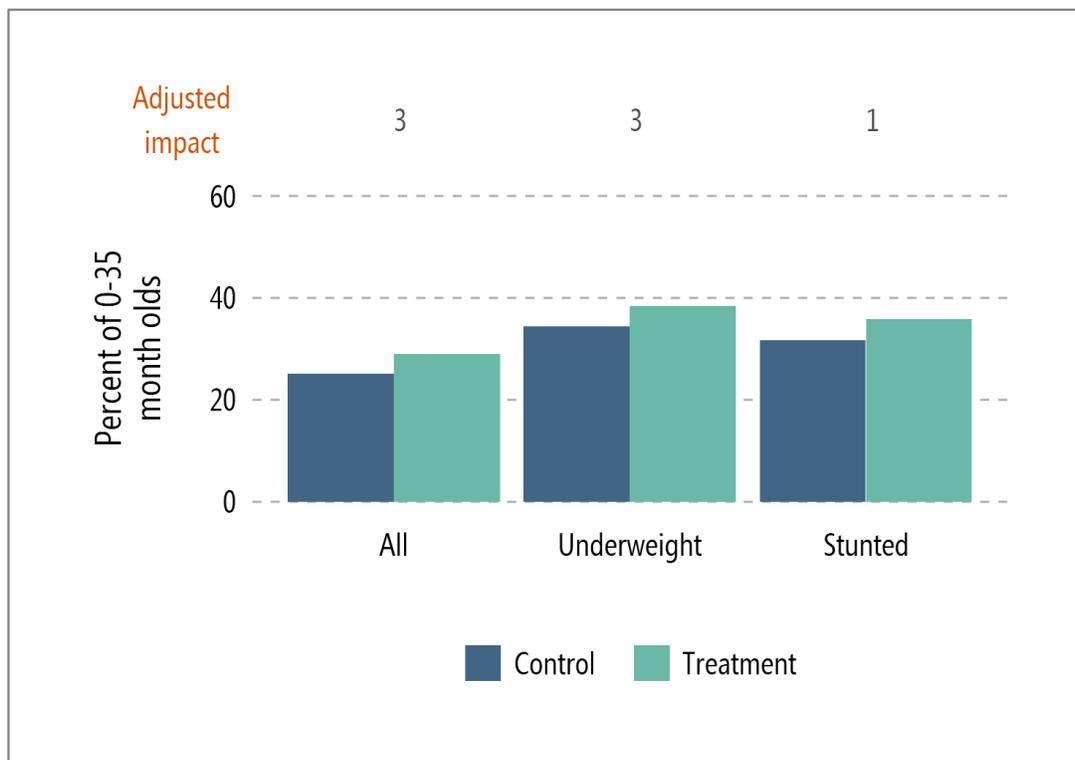
Sample size: 560 bidan (left panel), 625 bidan (right panel)

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**Bidan reported that most children who were eligible for PMT received it, but most caregivers of stunted and underweight children did not report receiving PMT.** In both 2017 and 2018, bidan in both treatment and control areas reported that the vast majority of children who met the criteria for PMT (more than 90 percent) received it, on average. However, when we look at underweight and stunted children (using anthropometric measurements from the endline survey data collection) who were taken to the posyandu in the six months before the endline, only 38 percent of underweight and 36 percent of stunted children in the treatment group received PMT, as reported by their caregivers (Figure 8.41). There was no statistically significant difference between the treatment and control groups in this measure. This means that many

children who are not stunted or underweight may be receiving PMT and/or bidan are failing to recognize that many undernourished children who are eligible for PMT are not receiving it.

**FIGURE 8.41 PERCENT OF 0–35 MONTH OLDS WHO RECEIVED PMT IN THE LAST 6 MONTHS, AS REPORTED BY CAREGIVERS**



Source: Caregiver endline surveys

Sample size: 7,171 caregivers (left panel), 2,326 caregivers of stunted children, 1,803 caregivers of underweight children

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

## 8.8 Child diarrhea and worms

Diarrhea is one of the leading causes of morbidity and mortality for children under age 5, accounting for 31 percent of deaths of children between 1 and 5 years of age in South-East Asia (Walker et al. 2012). Higher diarrhea prevalence is also associated with higher rates of stunting and undernutrition because it diminishes nutrient absorption (Checkley et al. 2008; Brown 2003). Similar to diarrhea, intestinal worms can lead to acute illness, anemia, cognitive impairment, stunting, and in rare cases mortality (Stephenson et al. 2000).

The Project aimed to affect childhood illnesses like diarrhea and worms through several channels. Most directly, it intended that CLTS would affect sanitation behavior by decreasing the prevalence of open defecation, a primary cause of diarrhea (Mara et al. 2010), and that the sanitation grant-making activity would help fund improved household sanitation infrastructure. Providers learned about handwashing and open defecation in the IYCF trainings, and thus were expected to impart these messages to caregivers in one-on-one counseling sessions, nutritional counseling sessions, and interactions at the posyandu. Moreover, providers were responsible for

promoting exclusive breastfeeding for the first six months, which has been shown to decrease the risk of diarrhea incidence, prevalence, and mortality (Lamberti et al. 2011; Victora et al. 2016). Results for this section are found in Appendix B Tables 8.58 and 8.59.

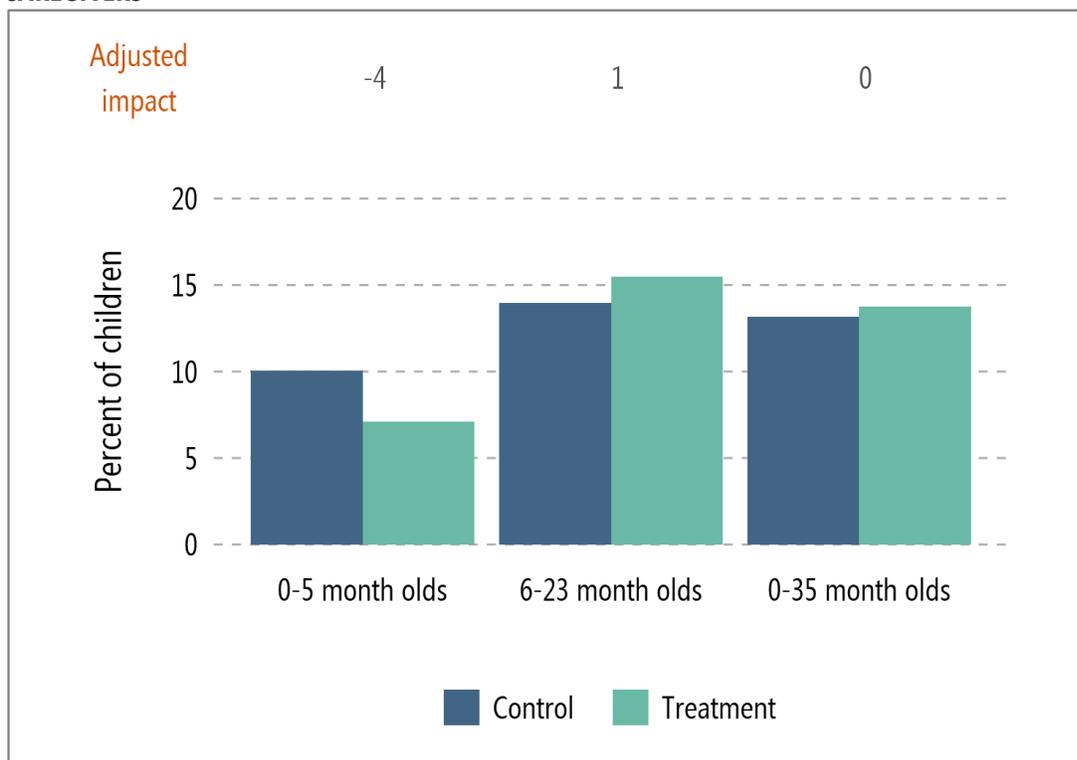
**The Project did not significantly reduce the incidence of child diarrhea.** At endline, about 7 percent of children under 6 months old in the treatment group had experienced diarrhea in the previous two week; this was 4 percentage points lower than in the control group, but the difference was not statistically significant. (Our ability to identify small impacts for this age group is limited because of the small sample size.) The overall incidence of diarrhea was higher but very similar in the treatment and control groups when older children were included (either the full 0–35 month old group or the 6–23 month old group) (Figure 8.42).<sup>75</sup>

For the most recent case of diarrhea experienced by children in the 0–35 month old sample, about 6 in 10 involved the caregiver seeking care for the child from a health provider, and about 4 in 10 involved treatment with ORS (we did not ask whether the ORS was obtained from a health provider or another source). These measures were all similar in the treatment and control groups at endline, although care-seeking at a provider increased by about 10 percentage points from baseline. Reports from providers suggest that kader posyandu in treatment areas were a statistically significant 10 percentage points more likely to discuss diarrhea identification, treatment, and prevention with mothers in the last six months, although there was no such difference for bidan. It is possible this impact on kader posyandu discussing diarrhea-related topics could be an effect of the IYCF training for kader posyandu, which included these topics. These increased discussions by kader posyandu might have contributed to reducing diarrhea incidence, but are likely too modest to be driving most of that impact; further, as shown above, they did not translate into impacts on treatment-seeking for diarrhea.

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<sup>75</sup> We also asked about the incidence of diarrhea in the previous four weeks, which is likely to be less accurate because of recall error, but might make it easier to detect impacts because incidence is higher. The pattern of findings was very similar to that for the two week measure, with a marginally significant lower incidence in the treatment group compared to the control group for children under 6 months old, but no significant treatment-control difference once older children were included.

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**FIGURE 8.42 INCIDENCE OF DIARRHEA IN THE LAST TWO WEEKS AMONG 0–35 MONTH OLDS, AS REPORTED BY CAREGIVERS**

Source: Caregiver endline surveys

Sample size: 1,490 caregivers of 0–5 month olds, 3,115 caregivers of 6–23 month olds, 9,120 caregivers of 0–35 month olds

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**Worm infections were uncommon and most were treated appropriately.** At endline, only about 7 percent of children 6–35 months old in the treatment group had experienced a worm infection in the previous 12 months, according to caregivers’ reports. This percentage was similarly low in the control group.<sup>76</sup> More than three-quarters of children who had a worm infection had been treated with deworming medication, a similar rate in the treatment and control groups.

<sup>76</sup> Worm infections might be underreported because diagnosis is expensive, requiring a laboratory analysis of a stool sample, and because the most commonly used test is not fully accurate (Croke et al. 2016). However, the rate of underreporting should be similar in the treatment and control groups since the Project did not explicitly focus on diagnosing worms.

## 9. SANITATION TRAINING, IMPLEMENTATION, AND OUTCOMES

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Children's nutritional status is affected not just by the quantity and quality of food they consume, but also their ability to process the food's nutrients. Undernutrition and enteric infections are closely related conditions; in particular, there is a correlation between stunting and diarrhea (Checkley et al. 2008), and worm infections can impede nutrient absorption and limit child growth (Stephenson 2000). Moreover, new research points to a chronic, sub-clinical condition called environmental enteric dysfunction (EED) caused by exposure to fecal contamination that can cause not just stunting but also anemia, impair brain development, and compromise the effectiveness of oral vaccinations (Humphrey 2009; McKay et al. 2010; Naylor et al. 2015).

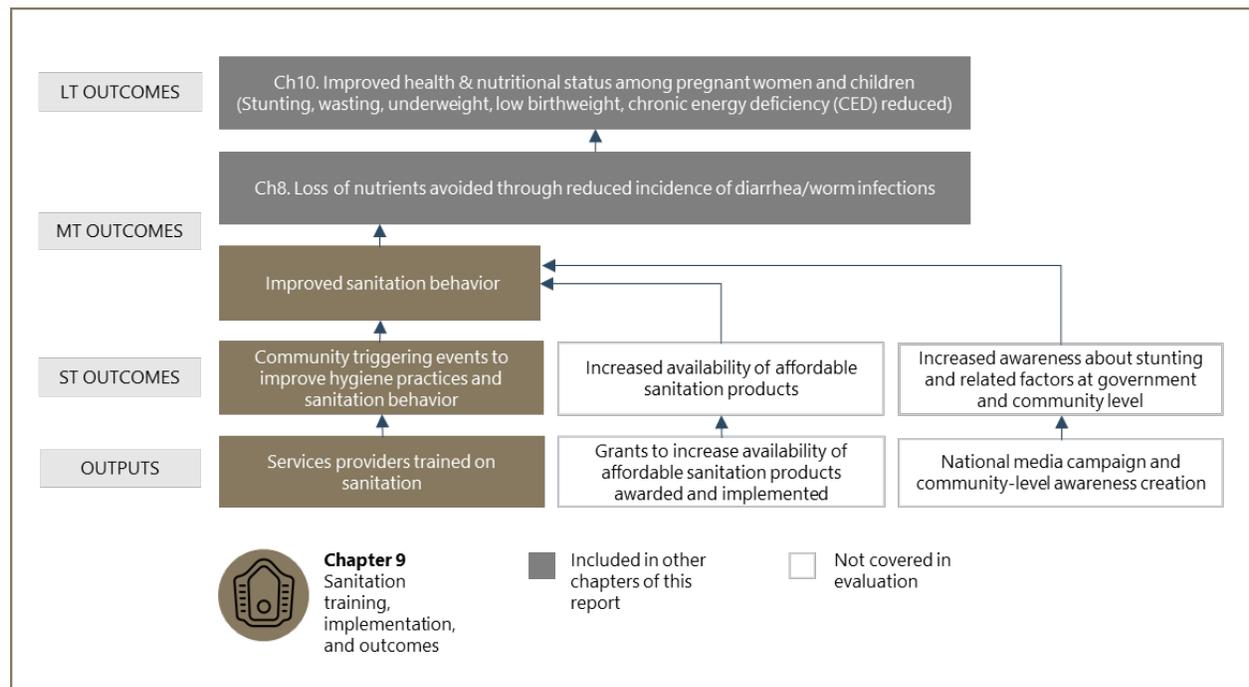
Because of this association between undernutrition and enteric infections, MCC included a sanitation component in the Nutrition Project that was closely aligned with the GoI's commitment to improving sanitation. Specifically, the Project trained sanitarians, or sanitation-promotion staff at the puskesmas, to implement the community-led total sanitation (CLTS) approach, which aims to mobilize (trigger) communities to take collective action to improve sanitation behaviors and become open defecation free (ODF). MCC expected that training sanitarians on CLTS would in turn improve households' knowledge about appropriate hygiene and sanitation practices. MCC also intended for the national communications campaign to encourage the adoption of these practices. Further, MCC expected that training sanitation entrepreneurs would help develop the sanitation infrastructure market, and that the sanitation grant-making activity would improve households' access to improved sanitation infrastructure. The combination of improved sanitation practices by members of children's households, as well as a broader improved sanitation environment at the desa level (signaled by a desa becoming ODF), would then reduce the incidence of diarrhea and worms, contributing to improved nutritional status among children.<sup>77</sup> This chain of events is shown in brown in Figure 9.1.

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<sup>77</sup> EED was not explicitly included as a medium-term outcome in the logic model, although improved sanitation behavior could also lead to improved nutritional status among children through this channel.

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**FIGURE 9.1 LOGIC MODEL WITH LINKS TO THE OUTCOMES IN THIS CHAPTER**



In this chapter we provide additional background on CLTS and present findings related to CLTS training and sanitarian knowledge (outputs), triggering and ODF status (short-term outcomes), and sanitation behavior (medium-term outcomes). We presented short-term outcomes related to increased awareness about stunting and related factors in Chapter 7 and medium-term outcomes related to diarrhea and worms in Chapter 8; long-term outcomes of improved health and nutritional status follow in Chapter 10.



## KEY FINDINGS ON SANITATION

- The Project increased the share of sanitarians trained in CLTS, but a high share of sanitarians in control areas also received CLTS training, through other channels.
- Although it was common for other organizations to provide CLTS training, the MCA-I trainings were longer, were more likely to include messages about stunting, and used more interactive teaching methods than other trainings.
- The Project had a positive impact on the percentage of desa that have been triggered; post-triggering visits became more common since baseline, but were not impacted by the Project.
- The proportion of desa that had been verified as ODF was low in treatment areas—about 2 in 10—and similar to control areas.
- The Project had no effect on sanitation facilities or behaviors; open defecation and unhygienic disposal of child stools were common, even among households with latrines. Thus, the improved characteristics of MCA-I trainings relative to other CLTS trainings did not lead to larger effects on key sanitation-related outcomes that might have affected stunting.

### 9.1 Background on CLTS

The Indonesian Ministry of Health has been promoting the CLTS model since 2008, when it launched the Indonesian National Strategy for Community-Based Total Sanitation and Hygiene (or *Sanitasi Total Berbasis Masyarakat* [STBM]). This approach has five pillars: (1) human feces disposal (achieving ODF status), (2) handwashing with soap, (3) treatment of drinking water at point of use, (4) solid waste management, and (5) liquid waste (household wastewater) management. The first two of these—helping communities become ODF and hand washing—were a particular focus of the Project.

To empower communities to become ODF, CLTS specifies a detailed process, which includes community gatherings to shift attitudes and motivate collective action (triggering), follow-up to ensure communities are working towards becoming ODF (post-triggering), and a process to determine whether a community is ODF (ODF verification).<sup>78</sup> This process works as follows:

- **Triggering.** Triggering is a half-day event conducted by trained kecamatan- and desa-level stakeholders that uses participatory approaches to illustrate the scale of the open

<sup>78</sup> Two other steps not explicitly covered in this report are strategic selection of target communities for implementing the model (pre-triggering, the first step), and community-led triggering of other communities (scale-up, the last step).

defecation problem in a given community, increase awareness of its negative effects on health, and kindle feelings of shame and disgust among community members. A triggering team, usually consisting of a sanitarian, three kader desa and a representative from the kepala desa's office, leads the triggering event. Each member of the triggering team assumes a role: lead facilitator, cofacilitator, content recorder, process facilitator, and environment setter. The content recorder is responsible for taking notes. The process facilitator ensures all triggering steps are carried out. The environment setter tries to make participants feel comfortable. Triggering seeks to encourage communities to take ownership of the problem of open defecation, and collectively develop a work plan to become ODF within one year.

- **Post-triggering.** Once triggering is complete, triggering team members revisit the community to conduct post-triggering activities that seek to ensure successful implementation of and adherence to the community work plan developed during triggering. Post-triggering follow-up visits are conducted by the triggering team members at the desa level, with support from puskesmas staff, such as the sanitarian or nutritionist.
- **ODF verification.** Following post-triggering, a verification team conducts ODF verification to ensure that all households have access to sanitary latrines and no one is defecating openly. The verification team is typically comprised of community members from the nearest neighboring desa, kader from the neighboring desa, and sanitarians from neighboring puskesmas. The team conducts verification through interviews with community members and desa administrators, and conducts site visits to check for feces in the environment. If verification teams confirm that a given desa is ODF, the sanitarian then organizes an ODF declaration ceremony with desa and government leaders.

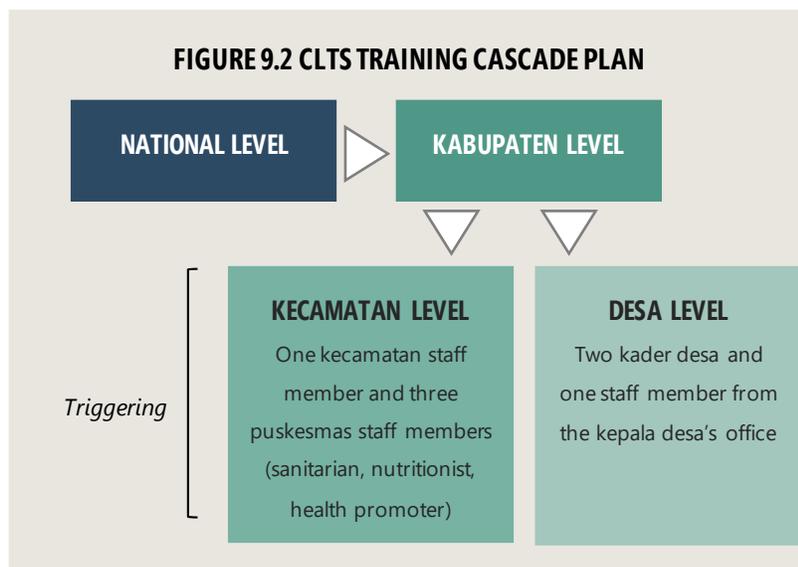
The Project funded CLTS training for sanitarians and kader desa, and provided sanitarians with funds for transportation to triggering events. In addition, MCA-I worked together with MoH to revise and improve the CLTS manuals. MCA-I reported that they distributed these improved manuals at all trainings they funded.

In addition to CLTS, the Project was expected to generally support improved sanitation behavior through four other mechanisms. First, the Project funded training for sanitation entrepreneurs such as local store owners and stone masons. These entrepreneurs were expected to help households in triggered areas construct latrines by sourcing affordable, local materials, building simple latrines, and connecting households to loans and other financing resources. Second, the sanitation grant-making activity was supposed to provide grants for projects that would generate private sector investment to improve hygiene practices, safe water and sanitation, and in turn reduce stunting. However, MCA-I received only three grant proposals that met the criteria for funding (out of a total of 13 received). (These proposals were related to supporting sanitation entrepreneurs who sell sanitation infrastructure.) Further, MCA-I amended these grant agreements to scale back some of the activities that were not able to be completed before the end of the Compact. Given the small number of grants and that they were scaled back, it is unlikely that this mechanism had a large effect on outcomes. Third, IYCF training included messages

about hygiene, especially handwashing, which trainees were expected to communicate to pregnant women and new mothers during one-on-one counseling sessions, nutritional counseling sessions, and at the posyandu. Fourth, the communications campaign, while largely focused on stunting, also encouraged families to use “healthy latrines” and “safe drinking water and storage.”

## 9.2 CLTS training and provider knowledge

Like the IYCF training, the CLTS training followed a cascade model (Figure 9.2), in which national trainers conducted training of trainers for DHO staff. In turn, DHO staff trained one staff member from each kecamatan administration and three puskesmas staff—usually the sanitarian if one existed, the nutritionist, and *promkes* (health promotion/outreach worker) staff member. Then, DHO staff and sanitarians trained desa staff: two kader desa and one person from the kepala desa’s office. The training covered the underlying motivation for CLTS and how to change participants’ behavior, with a particular emphasis on triggering and effectively communicating with participants. Each level of the cascade was supposed to include field practice or “on-the-job training” (OJT), which gave training participants a chance to hold triggering simulations with community members.



As we discussed in Chapter 1, MCA-I sought to train approximately 7,600 provincial and kabupaten representatives and other providers but managed to train approximately 6,700. They met targets at the provincial and kabupaten levels, but did not manage to train as many providers or volunteers at the kecamatan and desa levels as expected, mainly due to implementation delays. These delays also have implications for realizing steps in the theory of change since it was expected

that the effects of the CLTS training would synchronize with the effects of the IYCF training and households would simultaneously benefit from improved nutrition and sanitation practices.

Below we report results on who was trained in CLTS, over what timeframe, and who funded these trainings, as well as training duration, content, and methods. Detailed results are in Appendix B Tables 9.1–9.13.

### 9.2.1 Training participants and timing

As discussed above, the main trainees were DHO staff, puskesmas staff (most importantly, sanitarians because they lead sanitation efforts in the kecamatan, including coordinating triggering), kader desa, and staff from the kepala desa's office. Here we discuss who attended training and when.

**A significantly higher share of sanitarians received CLTS training in treatment areas compared to control areas, but more than half of sanitarians in control areas received training.** The percent of sanitarians trained in CLTS since 2015 was a statistically significant 24 percentage points higher in the treatment group compared to the control group (Figure 9.3).<sup>79</sup> However, 57 percent of sanitarians in the control group also received CLTS training since 2015. The high percentage of sanitarians in the control group that received CLTS training suggests that it may be difficult for the Project to demonstrate impacts on outcomes like triggering or ODF. (It is possible that the MCA-I trainings had characteristics that made them more effective than other CLTS trainings; later, we show that the MCA-I trainings had improved characteristics but that these did not make them more effective in improving key sanitation-related outcomes.)

Looking at other providers, significantly higher proportions of bidan coordinators, nutritionists, and bidan received CLTS training since 2015 compared to the control group. The largest impacts were for nutritionists, another provider that the MCA-I-funded training focused on. Specifically, 55 percent of nutritionists in the treatment group reported receiving CLTS training, about 48 percentage points higher than in the control group. About 11 percent of bidan coordinators and 18 percent of bidan in the treatment group received training—a statistically significant 10 and 7 percentage points higher than in the control group, respectively).

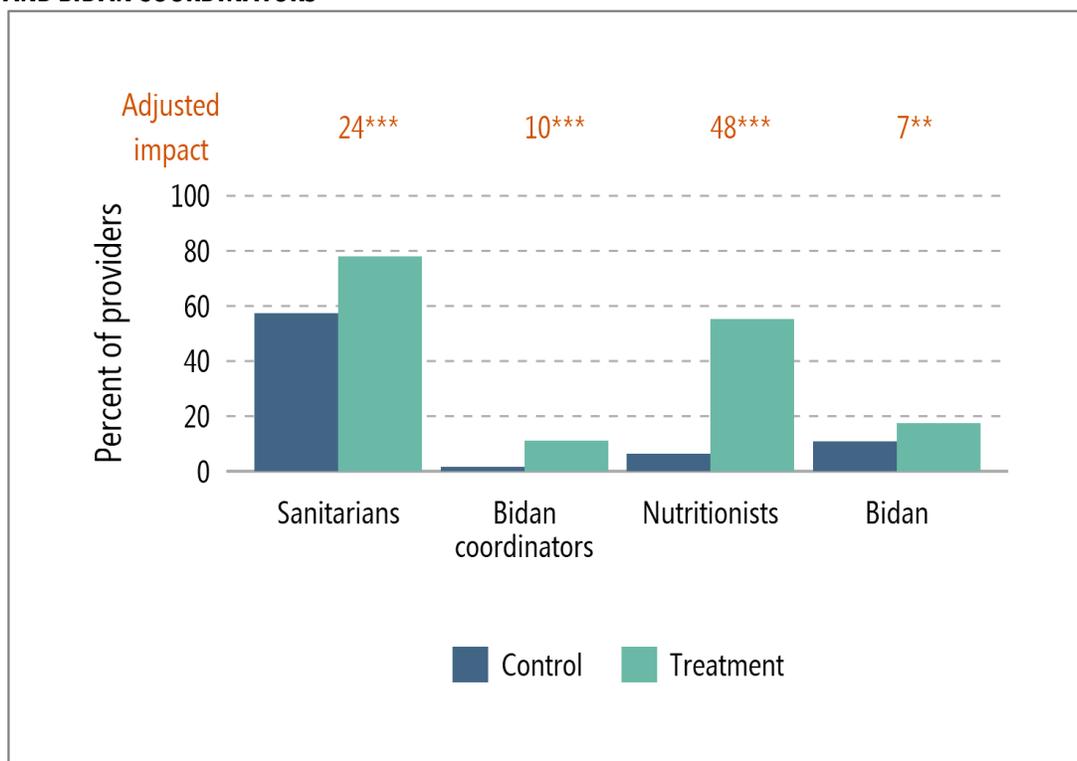
Although bidan and bidan coordinators were not necessarily a target audience for the CLTS training, we assume that they received CLTS training since they were acting as sanitarians or desa administrators in cases in which the puskesmas or desa government did not have a more appropriate staff member to send to training. (As we showed in Chapter 4, about one in five puskesmas in the sample did not have a sanitarian position, and a variety of other staff were taking on these responsibilities.) In responses to open-ended survey questions, DHO representatives also mentioned that allowing providers other than sanitarians to attend training was a feature of the MCA-I training. In contrast, CLTS trainings funded by other entities typically did not allocate funds for bidan, nutritionists, promkes, kader desa, or desa staff to attend trainings.

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<sup>79</sup> In this section we consider only CLTS trainings lasting more than half a day because true CLTS training is designed to last several days.

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**FIGURE 9.3 PROVIDERS TRAINED IN CLTS SINCE 2015, AS REPORTED BY SANITARIANS, NUTRITIONISTS, BIDAN, AND BIDAN COORDINATORS**



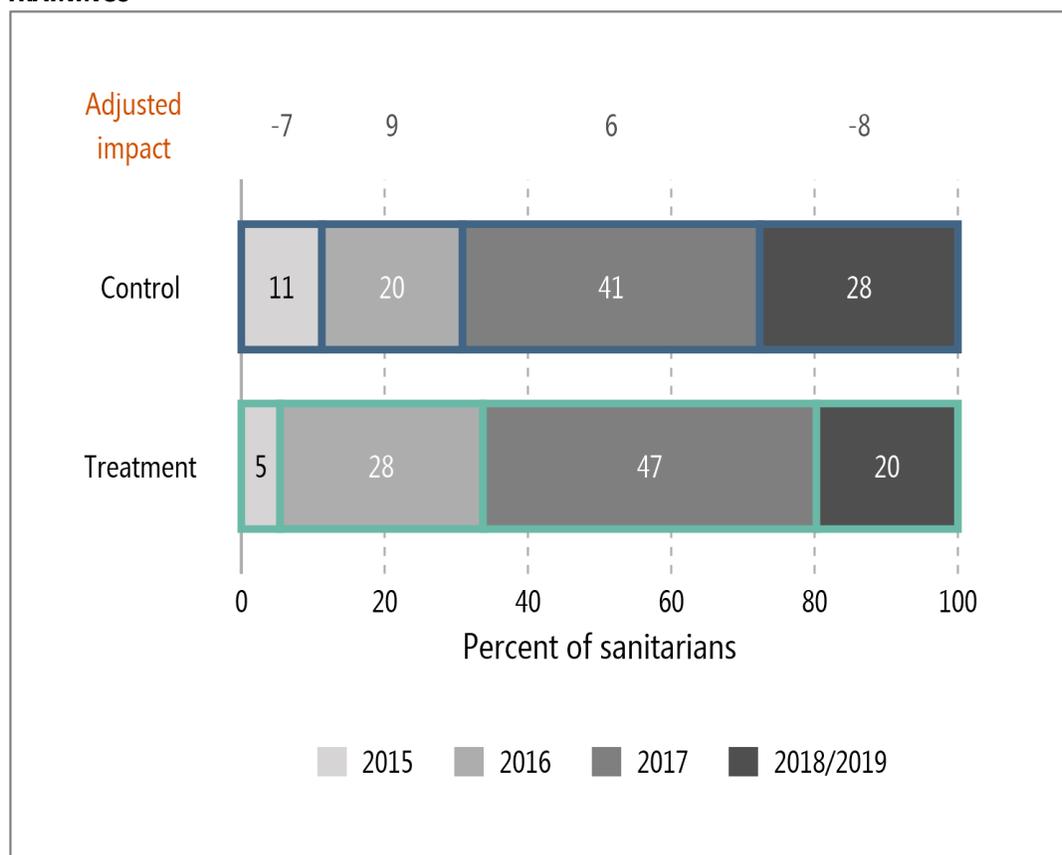
Source: Bidan coordinator, nutritionist, sanitarian, and bidan endline surveys

Sample size: 230 bidan coordinators, 220 nutritionists, 240 sanitarians, and 778 bidan

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**It was most common for sanitarians in treatment areas to receive training in 2017, and there were no statistically significant differences in the timing of training compared to the control group.** Forty-seven percent of sanitarians in the treatment group who were trained in CLTS since 2015 received their most recent training in 2017. (We only asked about the most recent training; on average, sanitarians reported having received two CLTS trainings since 2015.) Compared to control areas, a higher proportion of sanitarians were trained in 2016 and 2017, and a lower proportion were trained in 2018 or 2019, but these differences were not statistically significant (Figure 9.4).<sup>80</sup> The training in control areas in 2016 and 2017 was too soon to represent a scale-up or replication as a result of the MCA-I training; rather, it likely represents a broader focus on CLTS in Indonesia. (As we show later, the DHO and PHO largely took on the funding of CLTS training in areas not covered by MCA-I.)

<sup>80</sup> We also asked about the timing of training for nutritionists who were trained. In treatment areas, about half of these nutritionists received their most recent training in 2016, and about one-quarter in 2017. In control areas, very few nutritionists were trained.

**FIGURE 9.4 YEAR IN WHICH SANITARIANS WERE TRAINED IN CLTS, AMONG SANITARIANS WHO ATTENDED TRAININGS**

Source: Sanitarian endline survey

Sample size: 162 sanitarians

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**Sanitarians were equally likely to train kader desa and promkes staff about sanitation in the treatment and control groups, but the average number trained in the treatment group in 2018 was about half that in the control group.** The last step in the cascade training model is that DHO staff and sanitarians train kader desa or promkes staff in the catchment area of the puskesmas to spread awareness about proper sanitation and ODF and solicit their help in implementing CLTS. About 66 percent of sanitarians in the treatment group reported ever training these kader desa and promkes staff and there was no statistically significant difference among treatment and control groups in this measure.<sup>81</sup> This suggests that a similar cascade approach may have been used by other non-MCA-I-funded CLTS trainings.

However, sanitarians in the treatment group trained fewer kader desa and promkes staff in 2018—an average of 27 individuals in the control group compared to 14 in the treatment group, a statistically significant difference. We do not have an explanation for this difference other than

<sup>81</sup> Even among sanitarians who attended CLTS training, this number was only 69 percent, which may help explain why the sanitarians did not meet desa-level targets for training.

hypothesizing that kabupaten knew that MCA-I already trained a large share of kader desa and promkes staff prior to 2018 and that other projects were “catching up” with MCA-I in control areas.<sup>82</sup>

In CLTS, the desa administrators were often asked to support implementation—for example, by echoing support for eliminating open defecation or participating in triggering events. Because of this connection to CLTS implementation, we also asked staff in the desa administration about whether desa administrators or kader desa had received CLTS training.<sup>83</sup> Overall, about 6 in 10 desa in treatment areas received CLTS training for desa staff between 2014 and 2018, compared to about 5 in 10 desa in control areas, a statistically significant difference. Again, this suggests that training was common in control areas, although less so than in treatment areas.

### 9.2.2 Training characteristics

Here we look at features of the trainings, including duration, whether they included OJT, funders, content, and teaching methods.

#### *Duration and OJT*

CLTS trainings for puskesmas and desa-level staff were envisioned to last between three and five days and include classroom sessions and field practice, known as OJT. In the classroom, trainees learned about CLTS and practiced facilitating triggering. The OJT usually entailed practicing CLTS steps in the field, such as sensitizing the community and convincing villagers of the importance of stopping open defecation. (Villagers were asked to play different roles during the OJT—for example, to pretend to be resistant to triggering.)

**Trainings for sanitarians in treatment areas were slightly longer and slightly more likely to include OJT than those in control areas.** According to sanitarians, trainings in treatment areas lasted on average four days, including classroom sessions and OJT. This was about 0.7 days more than trainings reported by sanitarians in control areas, a small but statistically significant difference (Figure 9.5). (Both the classroom and OJT components of training were slightly longer in treatment areas, on average, but these differences were not statistically significant.). Eighty percent of trainings in treatment areas included OJT, a marginally statistically significant 10 percentage points higher than in control areas (Figure 9.5). Nearly all trainings in both treatment and control areas were conducted on a full-day rather than half-day basis.

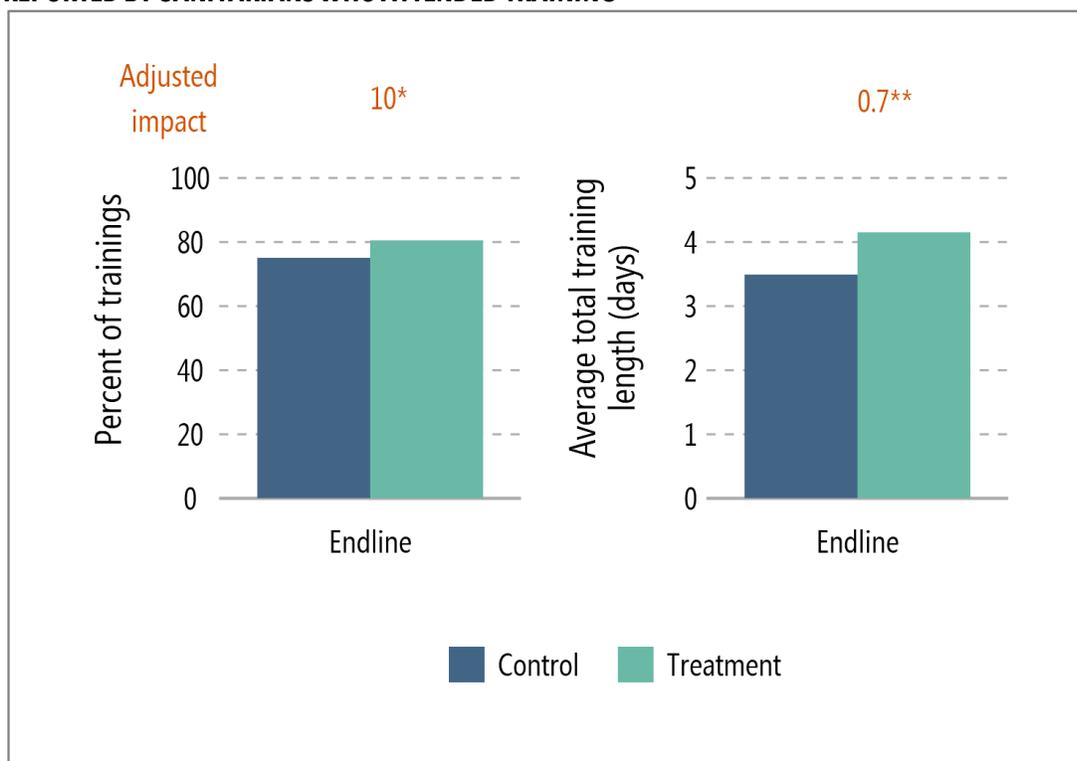
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<sup>82</sup> We asked only about 2018 in the survey because of the high risk of recall error for earlier years. It is possible that the number of individuals that sanitarians trained at the desa level may have been higher in treatment areas prior to 2018.

<sup>83</sup> We did not ask the equivalent questions about IYCF or growth monitoring training because desa administrators are not as involved in those trainings, which are largely coordinated directly through bidan and kader posyandu.

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**FIGURE 9.5 PERCENT OF TRAININGS THAT INCLUDED OJT AND AVERAGE LENGTH OF CLTS TRAINING, AS REPORTED BY SANITARIANS WHO ATTENDED TRAINING**



Source: Sanitarian endline survey

Sample size: 340 trainings attended by 162 sanitarians

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

The longer duration of trainings in treatment areas was corroborated by kabupaten representatives, who reported that MCA-I trainings were typically longer than other CLTS training. Specifically, we asked DHO in the 22 study kabupaten what distinguished the MCA-I trainings, and they frequently mentioned their longer duration. Several respondents mentioned that the MCA-I training was five days compared to three days for other trainings they held using local government funds (APBDesa).

### *Funding and sustainability*

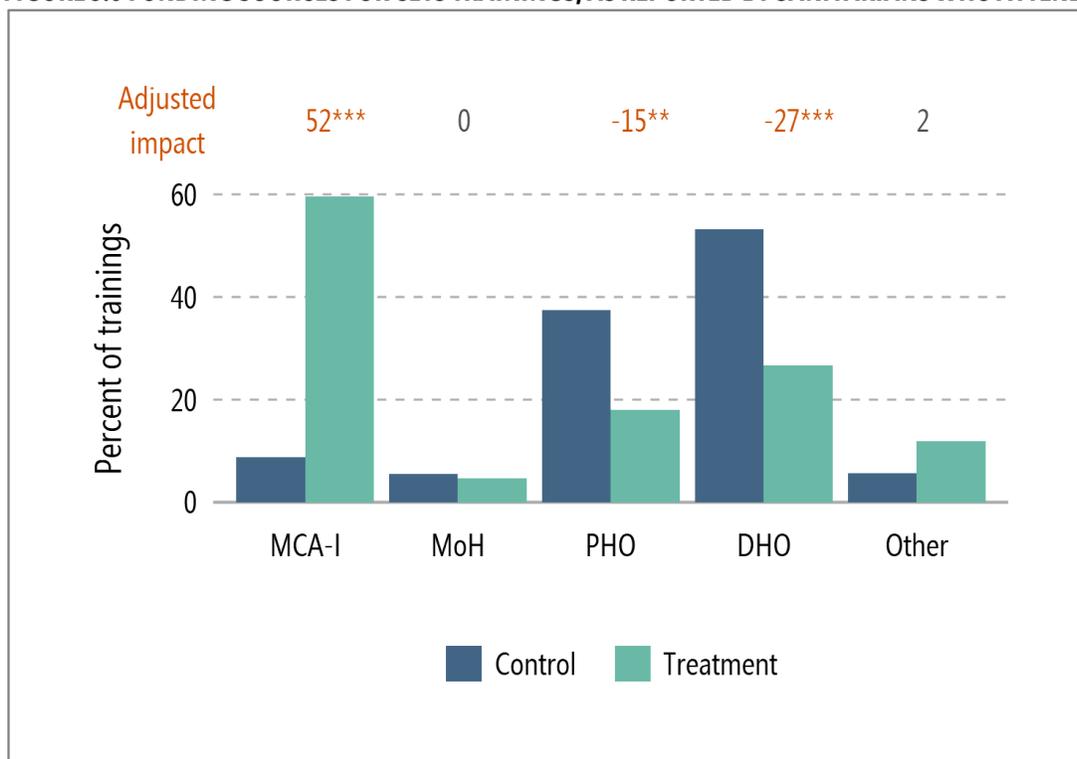
Similar to the analyses of IYCF and growth monitoring training in Chapter 7, we used respondent reports to determine the funding source for puskesmas and desa-level trainings.<sup>84</sup> We also examined the use of the MCA-I manuals for non-MCA-I CLTS trainings as a measure of sustainability.

<sup>84</sup> Similar to the analyses in Chapter 7, we explored alternative ways of asking about MCA-I as a funder—by asking respondents directly who funded each training and whether participants received MCA-I manuals (for the kabupaten level) or MCA-I training certificates (for the puskesmas level). However, we again found substantial inconsistencies across these measures. We therefore focus on the direct measure, as we did in Chapter 7.

**MCA-I was the primary funder of CLTS trainings in treatment areas.** According to reports from kabupaten representatives, about half of all trainings at the puskesmas level and about three-quarters of trainings at the desa level were funded by MCA-I. Looking at reports from sanitarians, 77 percent of sanitarians in the treatment group and 11 percent in the control group who were trained in CLTS since 2015 report attending an MCA-I training.

At the training level, 60 percent of CLTS trainings conducted in treatment areas since 2015 were funded by MCA-I compared to 9 percent in the control group, according to sanitarian reports about the funder of each training (Figure 9.6). In contrast, the primary funder in control areas was the DHO, which funded 53 percent of CLTS trainings compared to funding 27 percent of trainings in treatment areas. The PHO was another major funder of CLTS trainings in control areas, funding 38 percent of trainings compared to funding 18 percent of trainings in treatment areas. These differences in funders between the treatment and control areas were statistically significant.

**FIGURE 9.6 FUNDING SOURCES FOR CLTS TRAININGS, AS REPORTED BY SANITARIANS WHO ATTENDED TRAININGS**



Source: Sanitarian endline survey

Sample size: 340 trainings attended by 162 sanitarians

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**There is some evidence that the MCA-I materials were being used sustainably in new CLTS trainings.** As mentioned earlier, we looked at the use of MCA-I manuals as a measure of sustainability. Kabupaten representatives reported that approximately 25 percent of trainings at the puskesmas level and 40 percent of the trainings at the desa level that were not funded by

MCA-I used MCA-I manuals. However, we view these estimates with caution given that kabupaten representatives reported that a large fraction of MCA-I trainings did not use the manuals. Several kabupaten representatives also reported qualitatively that other trainings that the DHO funded used MCA-I materials. Overall, it appears that other trainings were borrowing MCA-I content although the extent of this is difficult to quantify. Nevertheless, as we show below, there were still substantive differences in the features of CLTS trainings in treatment and control areas, regardless of the use of MCA-I manuals.

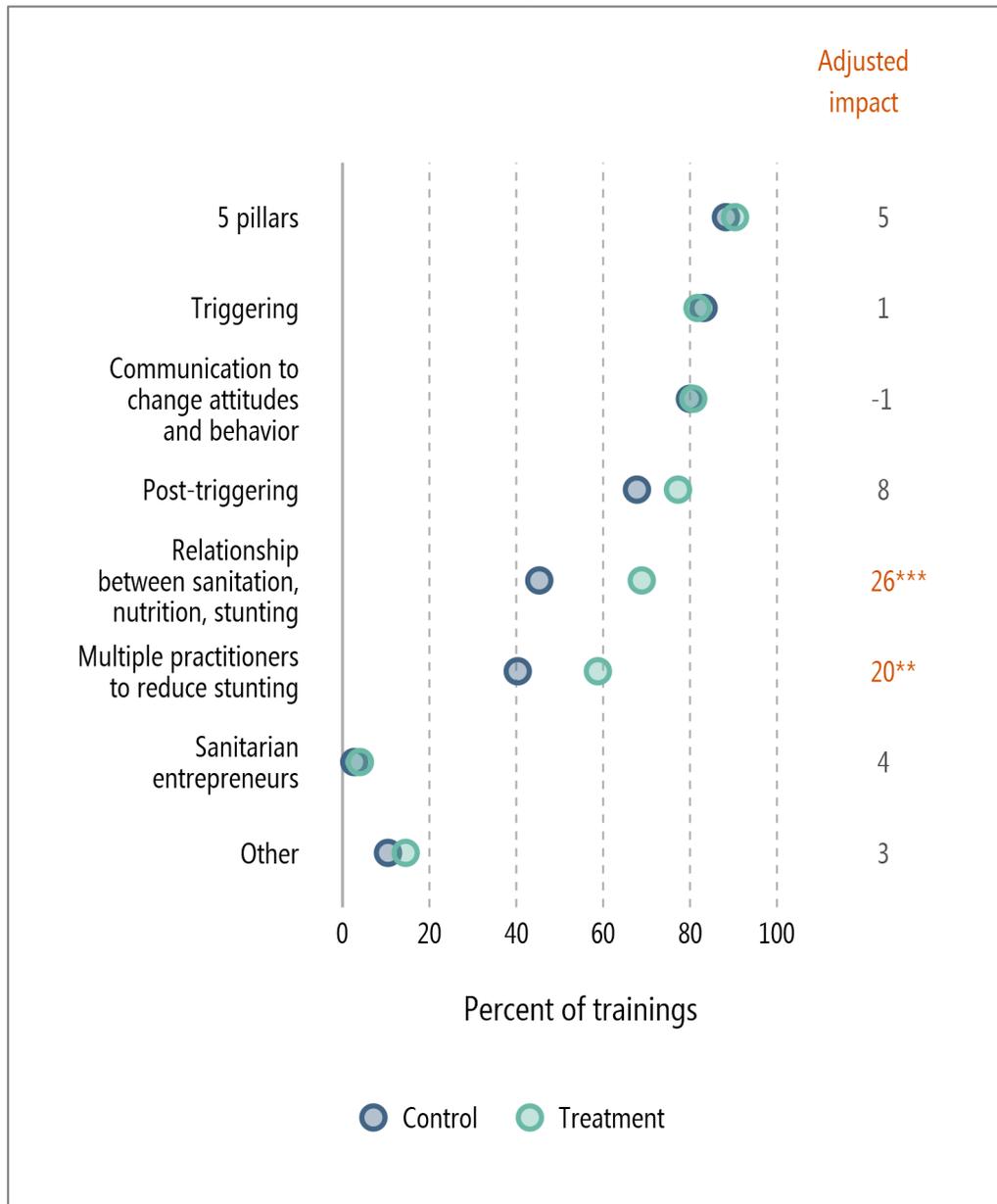
### *Training content*

The content of the training could affect (1) provider knowledge of the risks of poor sanitation and best practices for safe sanitation, and (2) provider capacity to conduct high-quality triggering events to foster behavior change. We asked sanitarians what topics were covered in the trainings and what topics they covered in their trainings with kader desa and promkes staff; we compare these reports in treatment and control areas.

**A focus on stunting was the primary difference between CLTS trainings conducted in treatment areas compared to those in control areas.** The most common training topic recalled by sanitarians in the treatment group who attended training was the CLTS five pillars (88 percent of sanitarians) (Figure 9.7). Other common topics were communication strategies to shift attitudes and change behavior (79 percent), and how to conduct triggering (85 percent) and post-triggering (79 percent). There was no statistically significant difference with the control group in these topics.

However, sanitarians in treatment areas were a statistically significant 23 percentage points more likely than those in control areas to report that the training covered the relationship between sanitation, nutrition, and stunting, and similarly more likely to report that they covered the importance of involving practitioners in multiple fields, such as maternal health, child health, and sanitation, to reduce stunting.

**FIGURE 9.7 TOPICS COVERED AT CLTS TRAININGS, AS REPORTED BY SANITARIANS WHO ATTENDED TRAININGS**



Source: Sanitarian endline survey.

Sample size: 340 trainings attended by 162 sanitarians

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

These results were consistent with the topics that sanitarians reported covering in the kader desa and promkes staff trainings. Specifically, sanitarians in treatment areas were significantly more likely to report covering the two stunting-related topics mentioned above (the relationship between sanitation, nutrition, and stunting, by 15 percentage points, and the importance of involving practitioners in multiple fields to reduce stunting, by 18 percentage points). They were

also significantly more likely, by 18 percentage points, to discuss communication strategies to shift attitudes and change behavior.

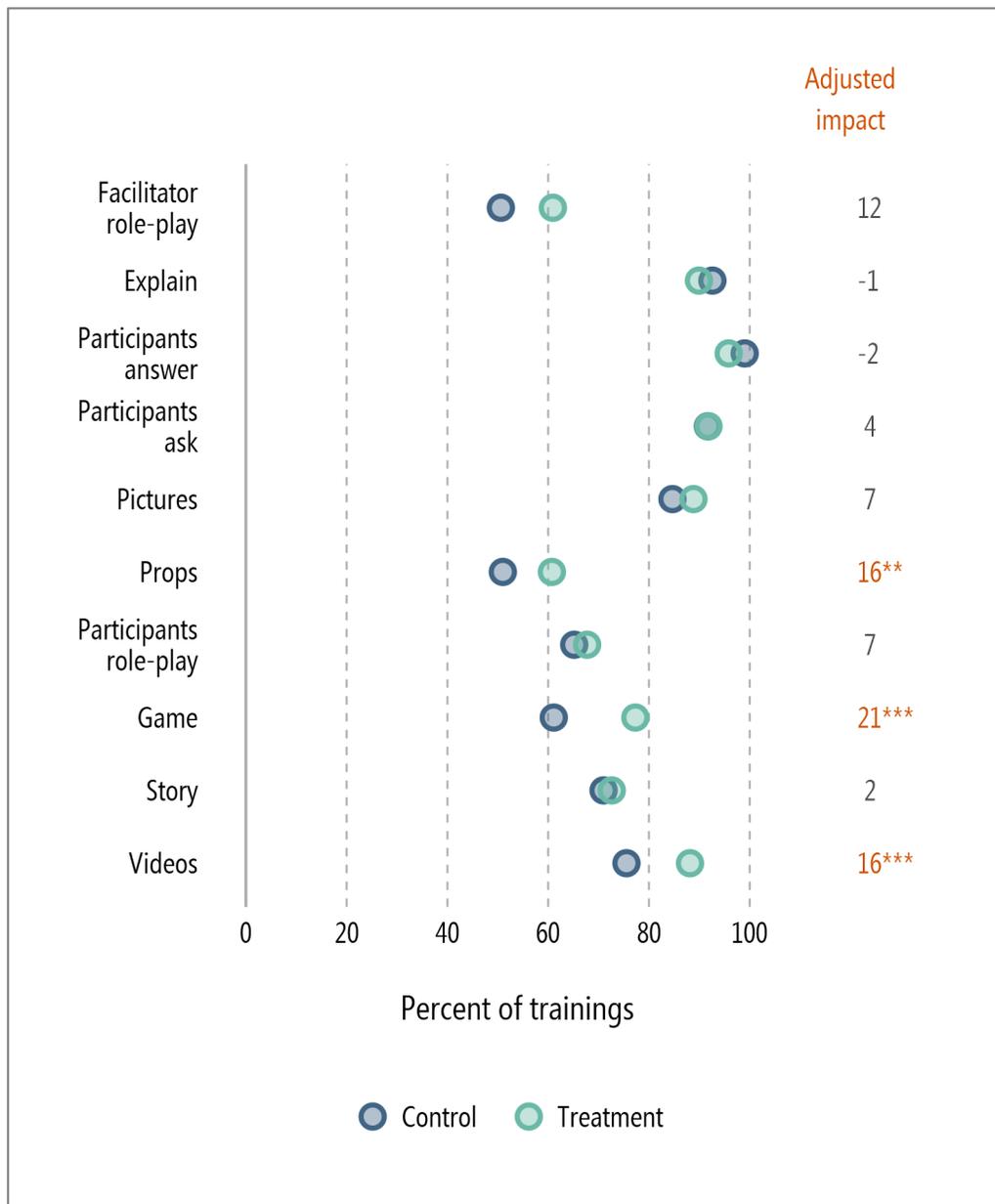
**The Project had no impact on sanitarians’ basic knowledge of training topics.** We asked sanitarians some basic questions about CLTS, sanitation, and stunting. Knowledge regarding all these questions was high and there was no significant difference in the proportion of sanitarians correctly answering the questions across treatment and control groups. Sanitarians were the least knowledgeable about the fact that stunting affects both physical and mental development, yet 85 percent of sanitarians in the treatment group still answered this question correctly. It is possible that the questions were not difficult or comprehensive enough to adequately assess what participants learned given that knowledge levels for these questions were overall high.

### *Teaching methods*

Similar to the IYCF and growth monitoring trainings discussed in Chapter 7, MCA-I not only modified the CLTS training content but also intended for their training to employ more innovative teaching methods. Below, we compare teaching methods in treatment and control areas.

**Videos, games, props, and interactive methods distinguished the CLTS trainings in treatment areas.** The most common methods used in trainings in the treatment group were traditional teaching methods: facilitators giving explanations, facilitators asking questions, and participants asking questions. These methods were used to a similar extent in control group trainings. However, trainings in the treatment group were more likely to involve non-traditional methods than those in the control group (Figure 9.8). Games and activities involving brainstorming or opinion sharing were more than 20 percentage points more common in treatment areas. Also significantly more common in treatment areas were videos, the facilitator using models or props, role-playing, practicing with “live” participants, and participants practicing when a facilitator demonstrated a technique or action.

**FIGURE 9.8 TEACHING METHODS USED AT CLTS TRAININGS, AS REPORTED BY SANITARIANS WHO ATTENDED TRAININGS**



Source: Sanitarian endline survey

Sample size: 340 trainings attended by 162 sanitarians

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

Kabupaten representatives also echoed this focus on innovative methods and quality instruction. For example, one representative noted that the MCA-I trainings “have similar materials and methods [as other trainings], but the facilitators could explain the materials well and in a more interesting way.” Other representatives emphasized that the trainers at MCA-I-funded trainings

were “more capable, with good public speaking skills,” and were “more enthusiastic” than those at other trainings.

Overall, although CLTS trainings were also common in control areas, the MCA-I trainings led to improvements in the characteristics of treatment area trainings. Specifically, trainings in treatment areas tended to be longer, were more likely to include messages about stunting, and used more interactive teaching methods than those in control areas. These improvements might have translated into large impacts on key sanitation-related outcomes, which could have affected stunting; however, as we show later, this did not occur.

### 9.3 Triggering and ODF

As described above, a key element of CLTS is triggering events, which are usually half-day community gatherings that include interactive activities to help community members confront the impact of open defecation and begin working on joint solutions. The Project expected to increase the number of communities that were triggered by providing training on the CLTS approach and triggering steps at the kabupaten, kecamatan, and desa levels, and by providing sanitarians with funds for transportation to triggering events. Triggering is a precursor to communities being certified as ODF, which means that all members of the desa use dedicated sanitation facilities that dispose of feces in an environmentally benign manner rather than on the ground or into or near a body of water.

As we discuss in Chapter 1, the Project sought to support triggering in 1,600 desa, or 6,400 dusun or RT/RW. Through this process, 800 desa, or 50 percent of those triggered, were expected to become ODF. However, according to the closeout ITT explanations document shared by MCC, 4,225 dusun/RT/RW were triggered (66 percent of the target) and 218 desa became ODF (27 percent of the target) by the end of the Compact.<sup>85</sup> The fact that there was a delay in training meant that triggering and ODF were also delayed, and thus MCA-I was not able to achieve these targets before the end of the Compact. In this section we examine the extent of triggering and ODF by participants in these processes, including sanitarians, kepala desa, and households. Detailed results are in Appendix B Tables 9.14–9.19.

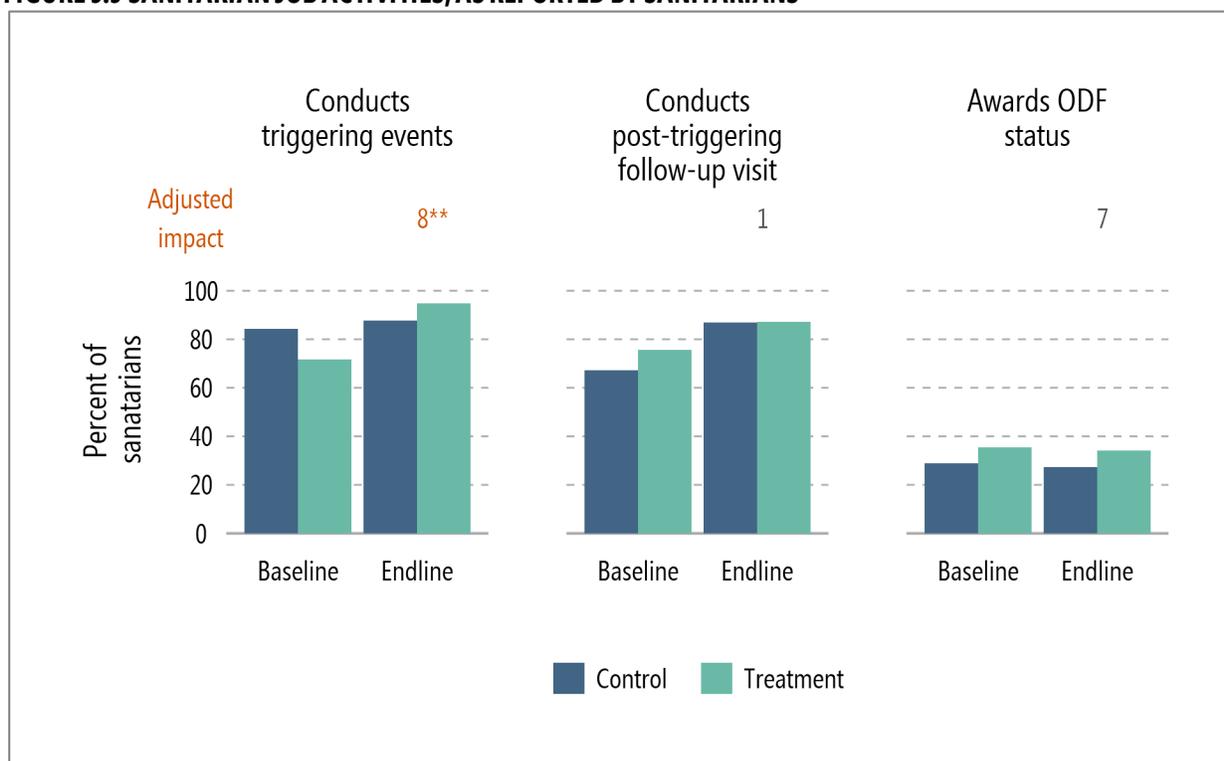
**The Project had a small but positive impact on the percent of desa triggered.**<sup>86</sup> At endline, 95 percent of sanitarians in treatment areas reported that they conduct triggering events as part of

<sup>85</sup> As we note in Chapter 1, the triggering target itself reflected lower dusun/RT/RW coverage than had originally been anticipated, and raised some concerns about the Project’s ability to achieve desa-level ODF by having the effects spread throughout the desa.

<sup>86</sup> Sanitarians reported the number of communities they supervised—and the number that were triggered or had ODF status awarded—at one or more geographic levels (desa, dusun, RW, lingkungan, or RT). Our reports of the percentage of communities that were triggered or ODF focus on the desa level because this was by far the most common level reported: 87 percent of sanitarians in treatment areas who conduct triggering reported triggering at this level and 87 percent reported awarding ODF status at this level. (The small percentage of sanitarians who only reported triggering or awarding ODF status at other levels besides the desa are therefore excluded from these

their jobs, a statistically significant 8 percentage points higher than in control areas (Figure 9.9). Sanitarians reported conducting about one more triggering event in 2018 in treatment areas compared to control areas, on average (they reported an average of 4.5 events in treatment areas).

**FIGURE 9.9 SANITARIAN JOB ACTIVITIES, AS REPORTED BY SANITARIANS**



Source: Sanitarian endline survey

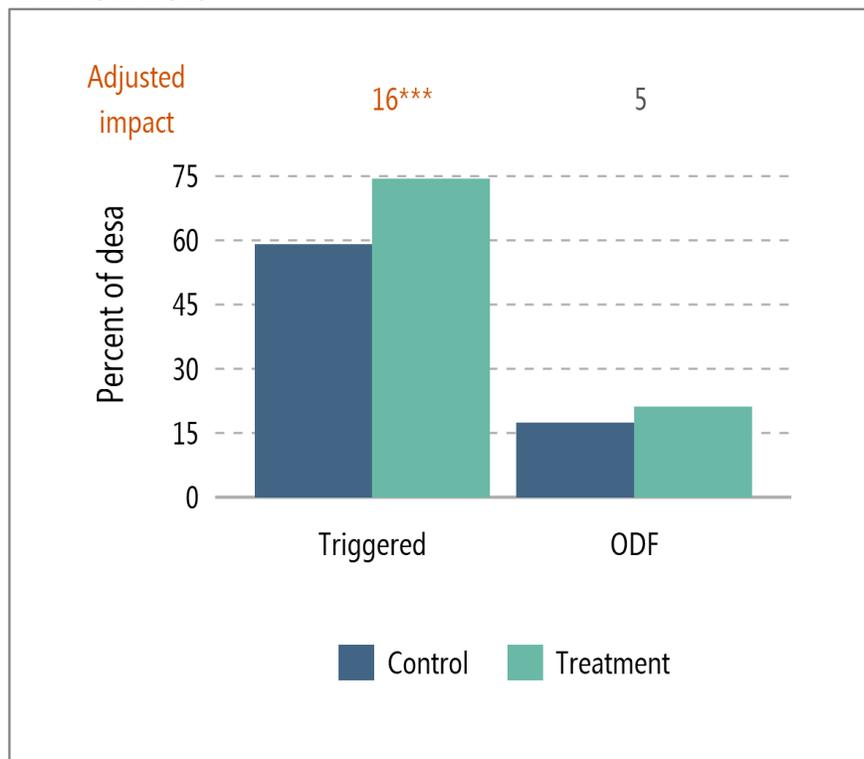
Sample size: 158–203 sanitarians (baseline); 219–240 sanitarians (endline)

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

On average, sanitarians in treatment areas reported that about 74 percent of desa that they oversee had been triggered, a statistically significant 16 percentage points higher than in control areas (Figure 9.10). The percentage of desa triggered in treatment areas was almost identical based on reports from desa administrators, but the difference with control areas was smaller (a marginally statistically significant 7 percentage points).

measures.) The results were similar when we re-estimated these measures based on the lowest level reported by each sanitarian.

**FIGURE 9.10 DESA TRIGGERED, AS REPORTED BY SANITARIANS, AND DESA ODF, AS REPORTED BY DESA ADMINISTRATORS**



Source: Sanitarian and desa administrator endline surveys

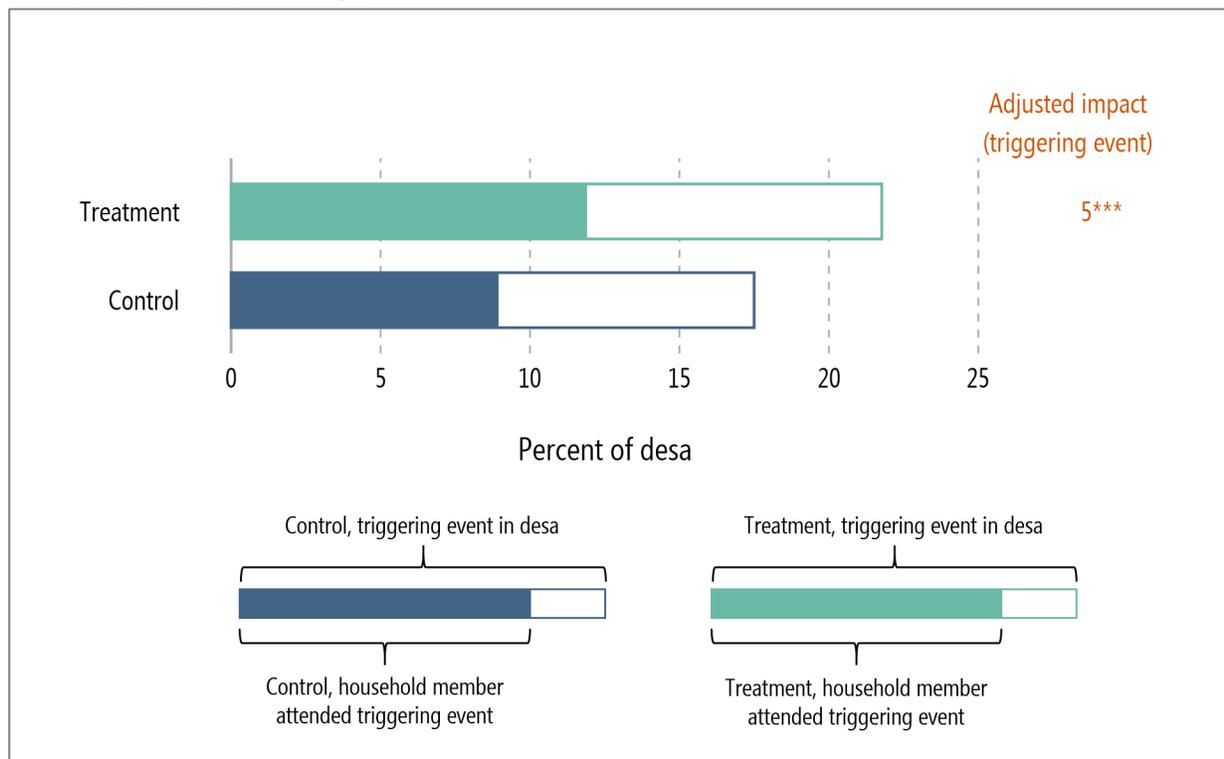
Sample size: 217 sanitarians and 600 desa administrators

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

These findings are consistent with impacts on triggering events as reported by households, although the prevalence of triggering was substantially lower compared to reports from sanitarians and desa administrators—likely because triggering is typically only conducted in a handful of dusun (at most four) within each desa.<sup>87</sup> At endline, about 22 percent of households in treatment areas reported that there had ever been a triggering event in their desa, a statistically significant 5 percentage points higher than in control areas (Figure 9.11). Only about half of respondents who reported a triggering event had attended one, with attendance slightly higher in the treatment group (by a statistically significant 3 percentage points). This suggests that the effectiveness of triggering might be limited since, to be effective in reducing open defecation, triggering is supposed to involve the entire community.

<sup>87</sup> The CLTS guidance is that the triggering team is supposed to trigger 4 dusun per desa (out of approximately 10 to 15 dusun per desa). The remaining dusun are supposed to implement triggering on their own, with or without triggering team support.

**FIGURE 9.11 HOUSEHOLD PARTICIPATION IN TRIGGERING, AMONG HOUSEHOLDS WHO REPORTED A TRIGGERING EVENT HAPPENED IN THEIR DESA**

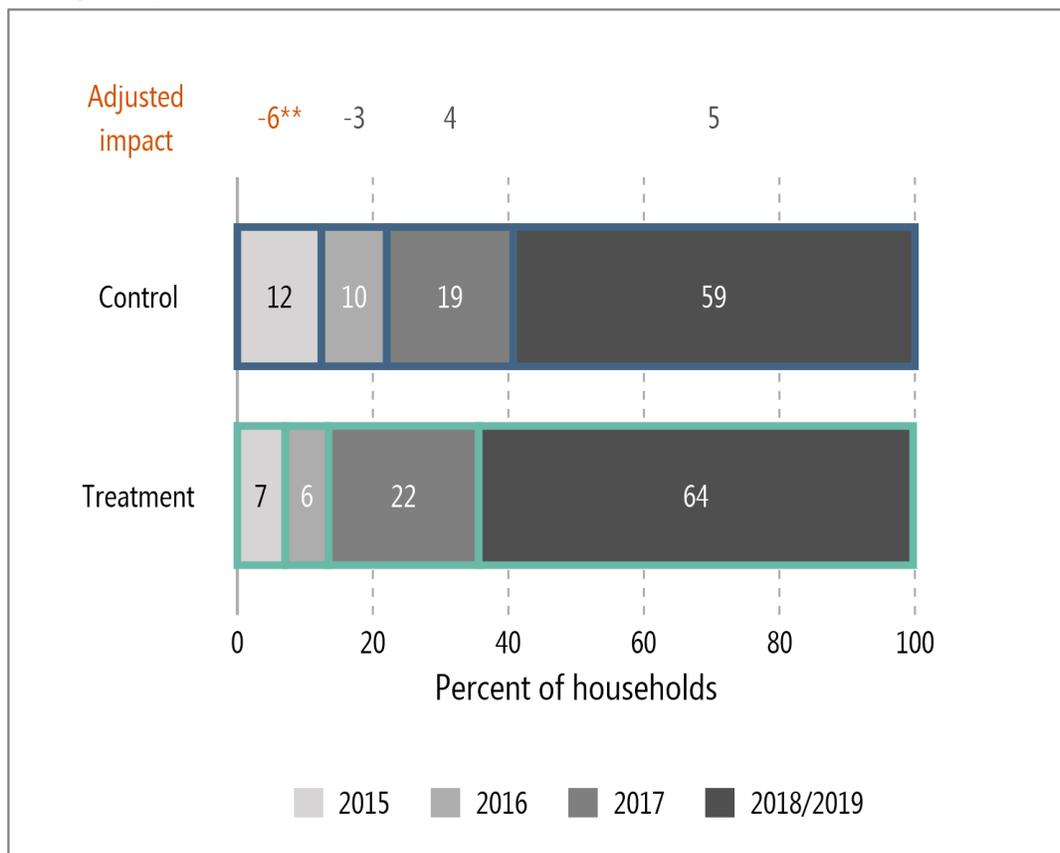


Source: Household endline survey

Sample size: 9,078–9,080 households

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

Among households in treatment areas who had attended a triggering event, the vast majority (86 percent) reported that the most recent event was held in 2017 or later (Figure 9.12); the timing of these events was broadly similar in the treatment and control groups. About 14 percent of households in treatment areas had attended another type of meeting related to sanitation, other than a triggering event. Similar to triggering events, the vast majority of households in treatment areas (almost 90 percent) reported that the most recent such event occurred since 2017, and both attendance and timing were similar in the control group.

**FIGURE 9.12 YEAR IN WHICH HOUSEHOLDS PARTICIPATED IN TRIGGERING, AMONG HOUSEHOLDS WHO PARTICIPATED**

Source: Household endline survey

Sample size: 1,201 households

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**Post-triggering visits were more common at endline compared to baseline, but were similarly common in the treatment and control groups; visits often excluded key post-triggering activities.** Once triggering is complete, community members are supposed to begin “post-triggering,” which focuses on ensuring successful implementation of and adherence to the community work plan developed during triggering. Post-triggering involves the community members, but also the sanitarian or nutritionist. Almost 90 percent of sanitarians in the treatment group who conducted triggering reported that they conducted post-triggering visits in triggered communities (Figure 9.9). On average, sanitarians in treatment areas conducted almost 8 post-triggering visits in the year before the survey.

Most commonly, post-triggering activities entail following up with specific households who had pledged to build a latrine to verify whether they had done so (reported by 89 percent of sanitarians who conducted post-triggering visits in treatment areas). Less common post-triggering activities included: updating the desa map to show newly-constructed latrines (26 percent), encouraging households to visit other recently triggered communities (25 percent), and

connecting households to sanitation entrepreneurs who might help them build latrines (1 percent). (The CLTS training emphasized all of these activities as components of post-triggering visits.)

Most of these measures of post-triggering visits were similar in the treatment and control groups at endline, although the percentage of sanitarians conducting post-triggering visits and the average number of visits increased substantially since baseline in both groups (by 20 percentage points and 4 visits, respectively, in the control group.)

**Only about 2 in 10 desa in treatment areas were ODF, similar to the proportion in control areas.** Based on reports from desa administrators, 21 percent of desa in treatment areas had been certified as ODF (Figure 9.10). This was very similar to the percentage in control areas, although both represent an increase from almost zero at baseline.

We also sought to capture information on ODF from sanitarians by asking them whether they awarded ODF status as part of their job, and asking those who did how many areas they supervised were ODF. Using this measure, we found that a large share of sanitarians (more than two-thirds) reported that they did not award ODF status (Figure 9.9). Some respondents might have misinterpreted the question on awarding ODF status to mean whether they issued ODF certificates, which they are not supposed to (these certificates are issued by the kabupaten government or the local MoH office). Because sanitarians who reported that they did not award ODF status were not asked about the ODF status of the areas that they supervised, the information about ODF status from sanitarians is incomplete.

Using sanitarian reports, we find that an even smaller percentage of desa were ODF than reported by desa administrators—12 percent in treatment areas (no statistically significant difference between treatment and control). Because the sanitarian measure might be biased down by erroneously excluding some sanitarians who awarded ODF status, we mainly rely on reports from the desa administration about ODF status. (Nevertheless, the two measures were consistent in the sense that they do not suggest any significant differences between the treatment and control groups.)

The limited impacts on ODF despite more positive impacts on triggering are consistent with two key findings from the interim study (Beatty et al. 2016). First, the interim study found that a key post-triggering step—that the community develops an action plan around how the community will change behavior and eliminate open defecation—was rarely implemented. If communities seldom took action as a result of the triggering, we would not expect a difference across treatment and control communities in terms of ODF status.

Second, the interim study found that communities lack funding for latrine construction, which is consistent with household reports that the biggest barrier to latrine construction is cost. Sanitation entrepreneurs, supported by the Project, were expected to build low-cost latrines and connect households to financing resources for latrines but the interim study found that they were largely inactive in Project areas. At endline, sanitarians in the treatment and control groups were

only aware of one such entrepreneur in their entire catchment area, on average; further, almost no sanitarians engaged with these entrepreneurs during post-triggering visits.

**A minority of triggered desa were ODF.** Looking just at desa that were triggered, we find that 22 percent in the control group and 25 percent in the treatment group were categorized as ODF by the time of endline in 2019. There was no statistically significant difference between treatment and control groups.

## 9.4 Water, sanitation, and hygiene conditions at the household level

In this section we discuss household-level water and sanitation conditions that could expose children to a contaminated environment. Specifically, we examine households' water sources and sanitation facilities, as well as their water and sanitation-related behaviors (including drinking water treatment, open defecation, and handwashing behavior), to assess how closely they are aligned with those emphasized by the CLTS approach. We also assess possible environmental contaminants in the form of animal feces. Detailed results are in Appendix B Tables 9.20–9.23.

For water sources, we identify the percent of households using an improved water source, which is defined as one that has “the potential to deliver safe water by nature of [its] design and construction” (WHO/UNICEF Joint Monitoring Programme 2017a).<sup>88</sup> For sanitation facilities, we used the WHO and UNICEF Joint Monitoring Programme's sanitation ladder (WHO/UNICEF Joint Monitoring Programme 2017b). This classification scheme focuses on improved sanitation facilities, which are defined as those “designed to hygienically separate excreta from human contact” (including through flies that could enter the latrine and transport fecal matter elsewhere).<sup>89</sup>

**Access to an improved water source increased from baseline, but the increase was similar in the treatment and control groups.** At endline, about 8 in 10 households in the treatment group used an improved water source (Figure 9.13).<sup>90</sup> A similar fraction of households treated their drinking water (mostly using recommended methods, namely boiling or chlorine) and had a water container that prevents contamination (a covered container with a narrow mouth, or a covered container with a wide mouth and dip-cup with a handle or tap). Results for these measures were all similar in the control group. The percent of households with access to an

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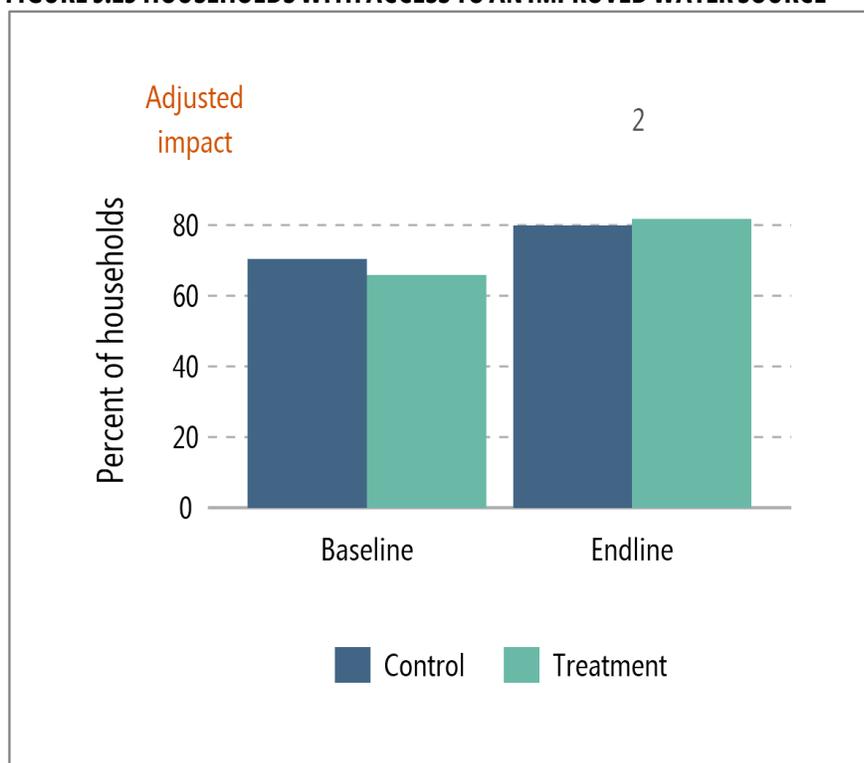
<sup>88</sup> Examples include piped water, boreholes or tube wells, protected dug wells, protected springs, rainwater, and packaged or delivered water.

<sup>89</sup> Examples include flush/pour flush to piped sewer system, septic tanks or pit latrines, ventilated improved pit latrines, composting toilets, and pit latrines with slabs.

<sup>90</sup> The WHO and UNICEF's Joint Monitoring Programme further classifies drinking water sources into a “ladder” comprising five categories rather than simply whether the water source is improved or not. However, we did not gather the information necessary to conduct this classification (for example, collection time for water sources not located on the premises).

improved water source increased substantially since baseline (10 percentage points in the control group), but the increase was similar in the treatment and control groups. This suggests that this increase is mostly not attributable to the impacts of the Project.

**FIGURE 9.13 HOUSEHOLDS WITH ACCESS TO AN IMPROVED WATER SOURCE**



Source: Household endline survey

Sample size: 4,560 households (baseline); 9,120 households (endline)

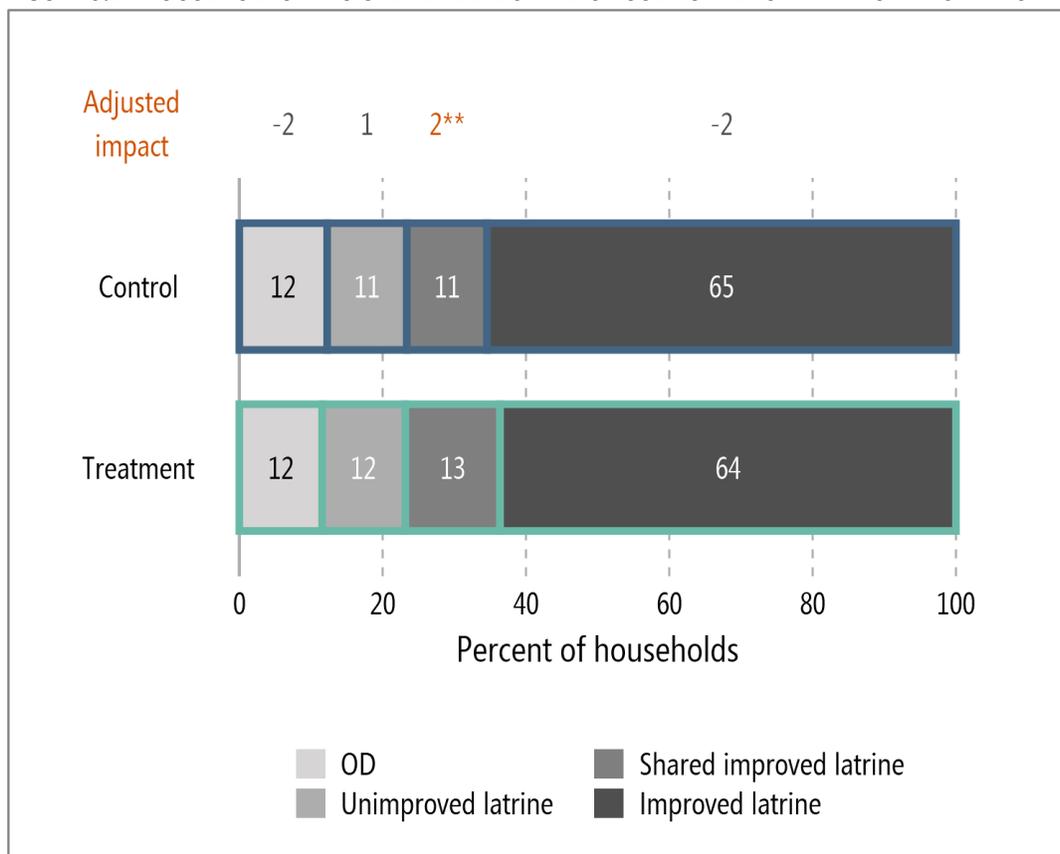
\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

**Sanitation facilities and conditions were similar in the treatment and control areas; open defecation was common even among households with access to latrines.** In treatment areas, about two-thirds of households had access to a non-shared improved latrine, which the Joint Monitoring Programme would categorize as at least “basic” service (Figure 9.14).<sup>91</sup> The rest were split roughly equally between the other categories, which are as follows, in descending order on the sanitation ladder: (1) a shared improved latrine (“limited” service); (2) an unimproved latrine; and (3) open defecation (no facility). Among households in treatment areas who did not have their own improved latrine, by far the most common reason cited for not constructing one was that it was too expensive (83 percent), followed by a lack of space (15

<sup>91</sup> “Basic” service is the second highest category on the Joint Monitoring Programme’s sanitation ladder. Because we do not have detailed information about excreta disposal, we cannot identify whether household’s sanitation facilities would qualify as a “safely managed”, which is the highest category and is defined as a non-shared improved latrine in which excreta are safely disposed (or transported and treated off-site).

percent). The types of sanitation facilities and reasons for not constructing improved latrines were similar in control areas.

**FIGURE 9.14 HOUSEHOLDS WHO OPENLY DEFECATED OR USED OTHER SANITATION FACILITIES**

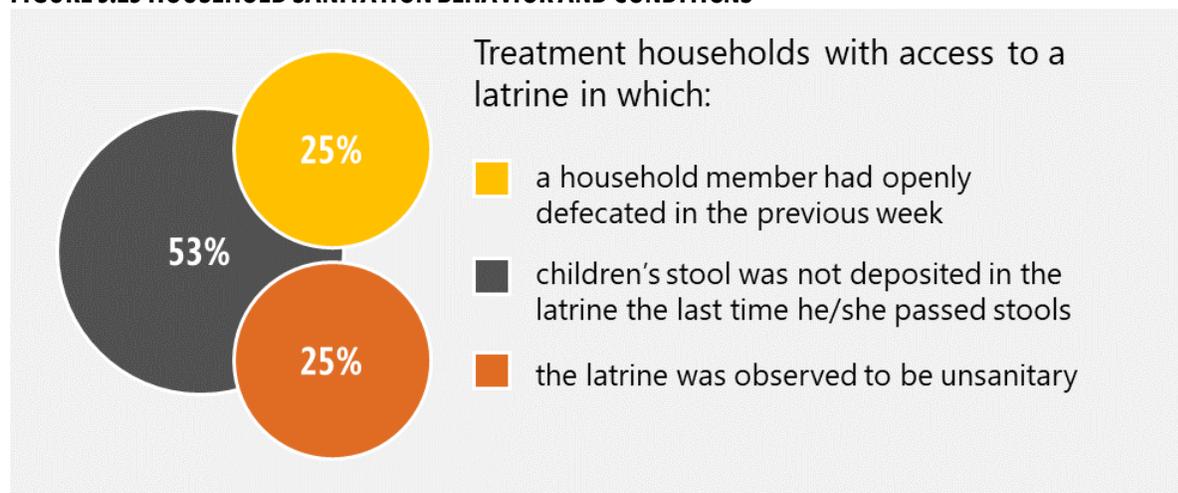


Source: Household endline survey

Sample size: 9,108 households

\* / \*\* / \*\*\* Significantly different from zero at the .10 / .05 / .01 level, two-tailed test

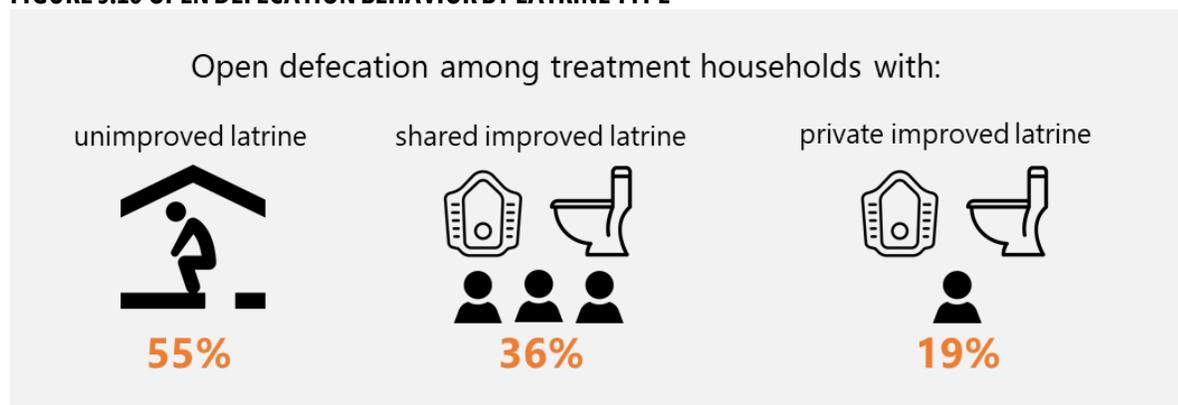
Although the vast majority of households (about 9 in 10 in treatment areas) had access to some type of latrine, a large share of these households continued to use unsafe sanitation practices, including open defecation and not disposing of children’s stools in the latrine (Figure 9.15). Further, a substantial fraction of latrines were maintained in an unsanitary condition, according to the survey team. These findings highlight the challenges of eliminating open defecation and fecal contamination of the environment even when latrines exist.

**FIGURE 9.15 HOUSEHOLD SANITATION BEHAVIOR AND CONDITIONS**

Source: Household endline survey

Sample size: 3,972 households (a household member had openly defecated in the previous week), 3,612 households (latrine was observed to be unsanitary), 3,964 (children's stool was not deposited in the latrine the last time he/she passed stools)

**Open defecation is more likely with a more basic type of latrine.** We discuss above that even a quarter of people with access to a latrine still openly defecate even if they have a latrine. It is more common for households with a poorer quality latrine to openly defecate than those with a higher quality latrine (Figure 9.16). Fifty-five percent of households in the treatment group with an unimproved latrine reported openly defecating in the last week compared to 19 percent of households with a private, improved latrine.

**FIGURE 9.16 OPEN DEFECTION BEHAVIOR BY LATRINE TYPE**

Source: Household endline survey

Sample size: 5,420 households (household uses an improved latrine that is not shared with others), 1,103 households (household shares an improved latrine), 1,276 (household uses an unimproved latrine)

**The Project had a small but positive impact on whether households ever received a demonstration on handwashing.** At endline, 33 percent of household heads in the treatment group reported that they had ever received a demonstration on handwashing, a small but statistically significant 6 percentage points higher than the control group. Among households in

treatment areas that had received such a demonstration, the demonstration was most commonly given by bidan (52 percent), puskesmas staff other than the sanitarian (23 percent), and the kader posyandu (12 percent). These households were significantly more likely to have received a demonstration from bidan or kader posyandu, and significantly less likely to have received it from puskesmas staff.

Provider reports were consistent with increased demonstration of handwashing by kader posyandu, although not by bidan. Specifically, kader posyandu in treatment areas were a statistically significant 11 percentage points more likely than those in control areas to report having discussed handwashing (79 percent in treatment areas) or demonstrated handwashing (64 percent in treatment areas) with pregnant women or caregivers of young children in the previous six months. (Even in control areas there were large increases since baseline, with the percentage of kader posyandu who reported demonstrating handwashing almost doubling.) However, there was no statistically significant difference between treatment and control areas in bidan reports of discussions or demonstrations around handwashing. There was also no difference between the treatment and control groups in receipt of written materials or mass media messages on proper handwashing, another potential channel of information on this subject (about two-thirds of households in both groups reported receiving these materials or messages).

**Self-reported handwashing behavior was similar in the treatment and control areas.** For example, in both types of areas just over 70 percent of household heads reported washing their hands with soap the last time before eating, and just over 85 percent reported doing so after the last time they used the toilet. (Because respondents might have provided the socially desirable responses, these self-reports could be viewed as an upper bound for actual handwashing behavior.) About two-thirds of households in both types of areas had a specific place to wash their hands (such as a tap or a bucket), and slightly more had soap available near their handwashing facility (this facility was commonly a large open tank of water used for multiple purposes). Overall, the small impacts on handwashing demonstrations do not appear to have resulted in measurable changes in handwashing behavior. (We did not observe handwashing to measure whether respondents were using correct handwashing techniques, which might have been affected by the demonstrations.)

**Many children were at high risk of exposure to contamination from animal feces in their daily environment, and this was similar in the treatment and control areas.** Animals, particularly chickens, can be carriers of pathogens that are also infectious for humans, so exposure to animal feces can put young children at risk of illness. The survey team observed animals (including fowl, such as chickens, ducks, and geese) in or around about two-thirds of households in treatment areas, and fowl in or around about one-half of households.<sup>92</sup> In about one-third of households they observed human or animal feces visible in the house or surrounding living area. This suggests that many children were at high risk of exposure to fecal contamination

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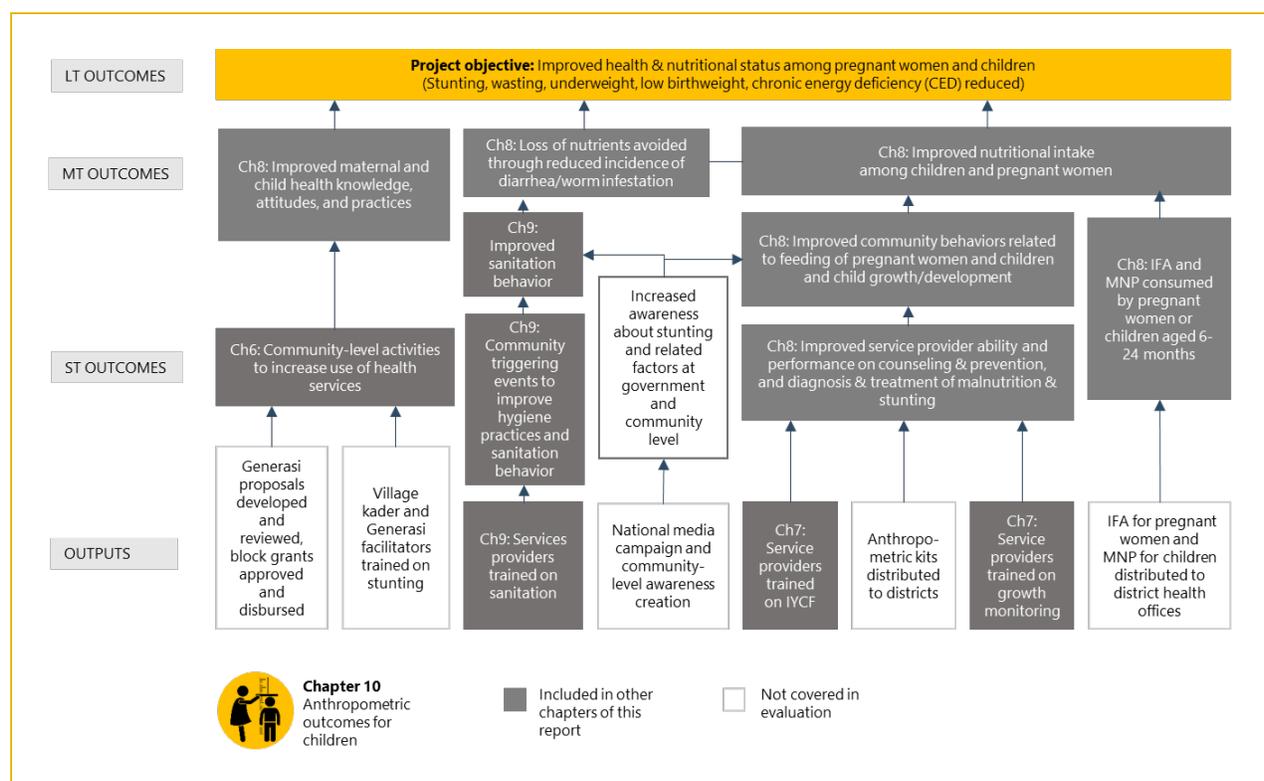
<sup>92</sup> In an analysis using the baseline survey data, we found that there was no statistically significant association between whether the household owned fowl with stunting, nor between whether human or animal feces were visible in the house or living area and stunting. However, among households that owned fowl, stunting rates were 25 percent lower in households that did not allow fowl into their homes.

from their immediate environment. However, these observations were very similar in the control group, suggesting that as the Project is unlikely to have affected outcomes such as child diarrhea or anthropometric measures through this channel.

## 10. ANTHROPOMETRIC OUTCOMES FOR CHILDREN

In this chapter we present results related to the Project’s long-term outcome of “improved health and nutritional status among pregnant women and children”, as measured by rates of child stunting, wasting, underweight, and low birthweight.<sup>93</sup> Figure 10.1 shows that these long-term outcomes are the culmination of all short- and medium-term outcomes and outputs in the program logic. Consistent with the limited or modest Project impacts on short- and medium-term outcomes such as prenatal care, breastfeeding, complementary feeding, diarrhea incidence, and related knowledge and practices by caregivers and providers in earlier chapters, we find little to no impacts on the long-term outcomes in this chapter.

**FIGURE 10.1 LOGIC MODEL WITH LINKS TO THE OUTCOMES IN THIS CHAPTER**



<sup>93</sup> As discussed in Chapter 3, we did not survey pregnant women at endline so we do not report on changes in chronic CED as envisioned in the program logic.



### KEY FINDINGS ON ANTHROPOMETRIC OUTCOMES

- Overall stunting rates declined between baseline and endline, largely driven by a decrease in severe stunting.
- However, this decrease was similar in treatment and control areas; the Project therefore had no impact on stunting, even for the cohort with the most Project exposure.
- The Project also had no impact on the percent of underweight or wasted children.
- The Project did not substantively reduce the rate of low birthweight.

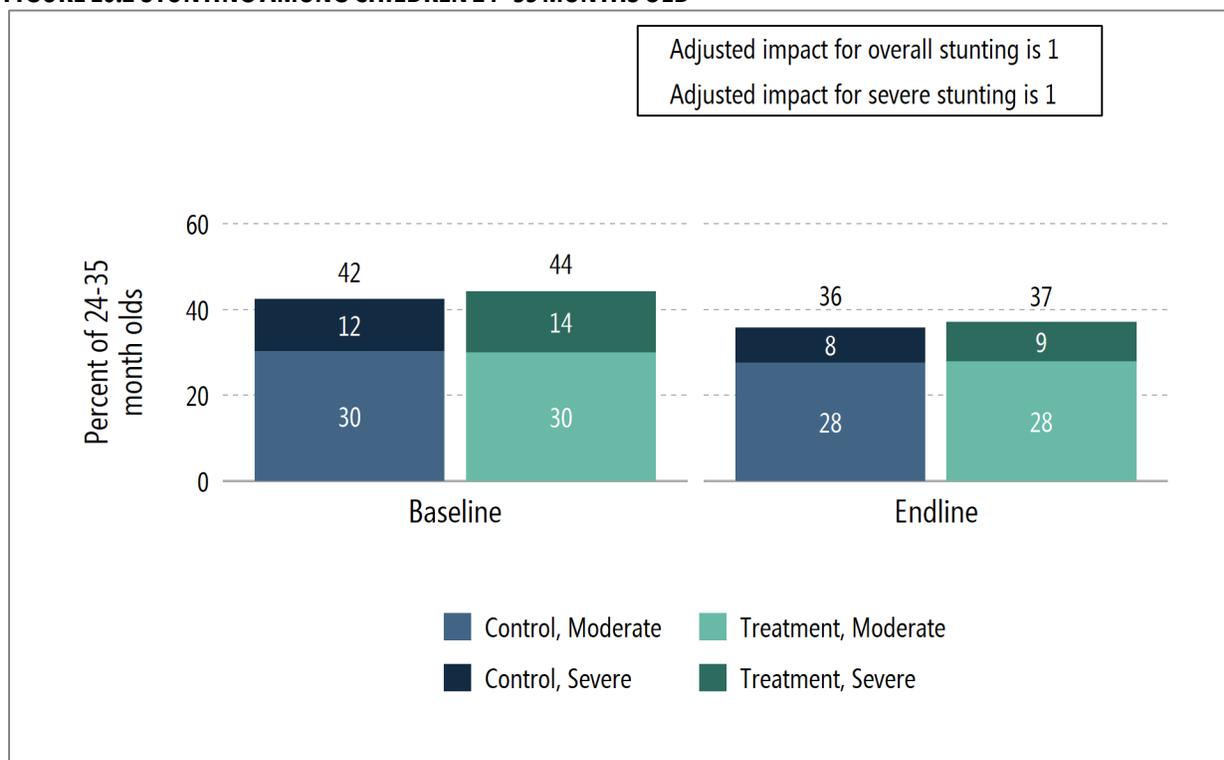
Because, as discussed in Chapter 3, children who were 24–35 months old at endline would have had the most exposure to the Project interventions, this age group comprises our primary analysis sample for the long-term outcomes discussed in this chapter. Nevertheless, for completeness we also explore results for the full sample of children who were 0–35 months old at endline as a secondary analysis. Detailed results are in Appendix B Tables 10.1–10.10.

**The Project had no impact on the probability of children being stunted, even for the cohort with the most Project exposure.** At endline, 37 percent of children 24–35 months old in treatment areas were stunted, a decrease from the baseline level of 44 percent, driven mainly by a decrease in severe stunting (Figure 10.2). However, the stunting rate decreased similarly in control areas, so that children were still equally likely to be stunted in treatment and control areas at endline. Average height-for-age z-scores were also similar in the treatment and control groups (Figure 10.3 shows the distribution of z-scores for stunting in the treatment group; the distribution in the control group was very similar but not shown, for clarity). Similar to the findings for the 24–35 month old sample, there is no evidence that the Project reduced stunting for the full 0–35 month old sample.

The decrease in the stunting rate in treatment and control areas in the Project provinces is consistent with findings from other studies. Data from the 2018 *Riskesdas* survey show a national decrease from 37 to 31 percent between 2013 and 2018, with severe stunting decreasing from 18 to 12 percent over this period (Kementerian Kesehatan 2018). Further, the long-term evaluation of *Generasi* (Olken et al. 2018) found that the prevalence of stunting decreased from 44 percent to 26 percent in control and treatment areas between 2009 and 2016. The authors surmise that this—as well as other dramatic improvements in health and education outcomes, even in control areas—may have been due to the increase in the number of social protection programs over time and the general improvements in the overall health and education

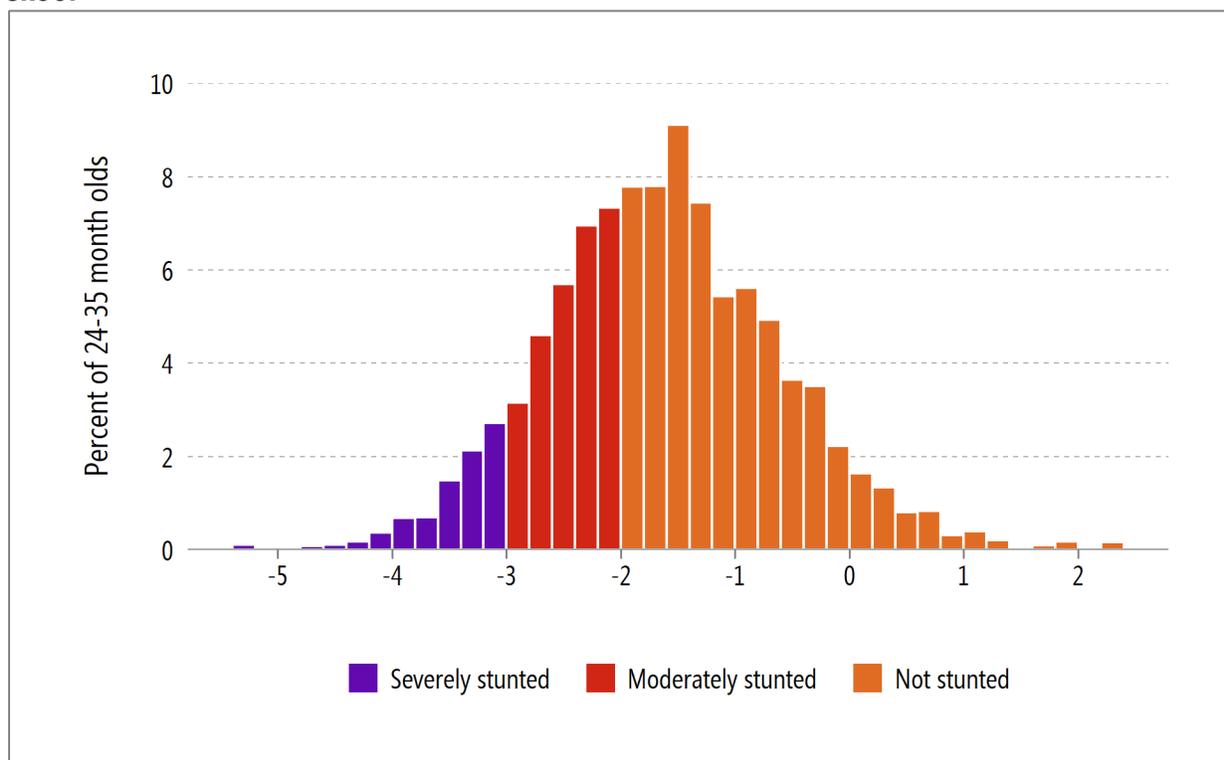
environment across Indonesia.<sup>94</sup> However, to our knowledge, there is to date no research on the reason for the stunting decline shown in the Riskesdas report.

**FIGURE 10.2 STUNTING AMONG CHILDREN 24–35 MONTHS OLD**



Source: Baseline and endline caregiver surveys  
Sample size: 916 caregivers (baseline); 4,513 caregivers (endline)

<sup>94</sup> Olken et al. (2018) analyzed 50 different explanatory variables to determine which were correlated with the observed overall decline in stunting between 2009 and 2016. They found that improvements in clean water sources, latrine use, height measurement, and participation in early child education and development programs were correlated with reductions in stunting, while improvements in maternal health knowledge, maternal education, and health education had no association with changes in stunting. Reductions in open garbage disposal and increases in exclusive breastfeeding were paradoxically correlated with increases in stunting rates.

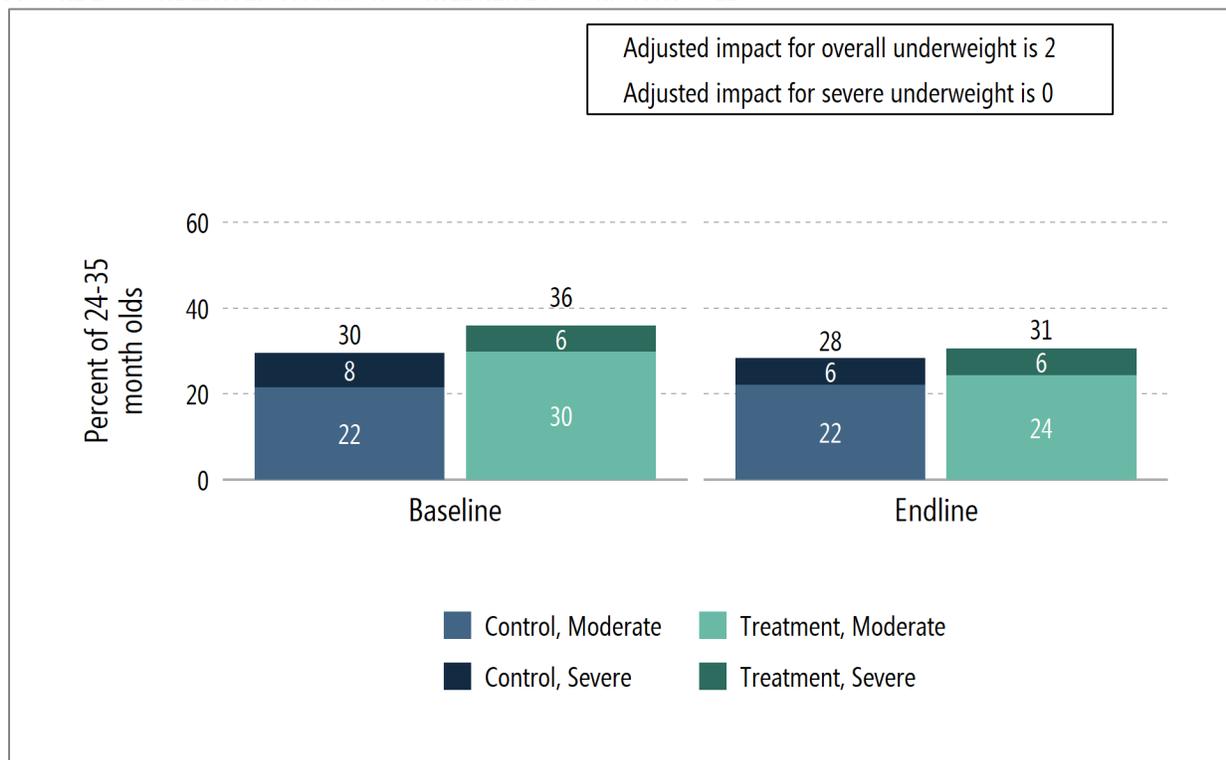
**FIGURE 10.3 DISTRIBUTION OF HEIGHT-FOR-AGE Z-SCORES AMONG CHILDREN 24–35 MONTHS OLD, TREATMENT GROUP**

Source: Endline caregiver survey

Sample size: 916 caregivers (baseline); 4,513 caregivers (endline)

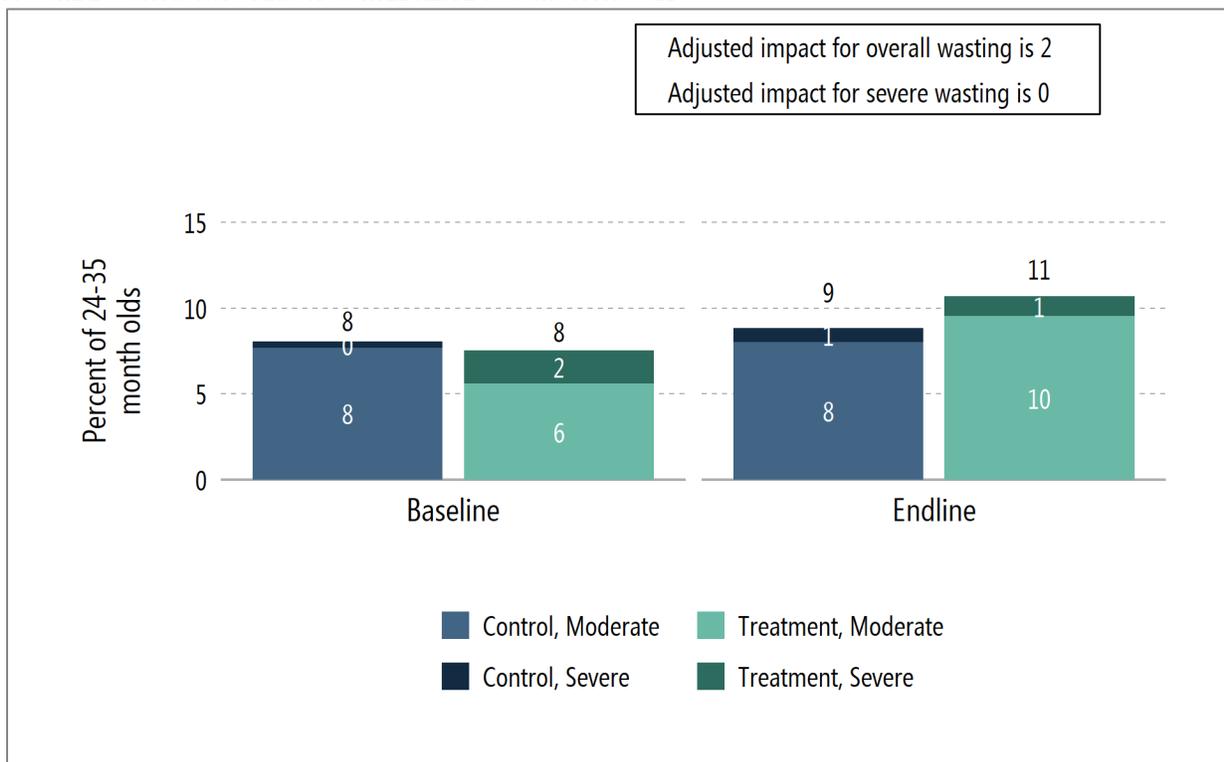
**The Project also did not reduce the probability of children being underweight or wasted.** In treatment areas at endline, about 31 percent of children in the 24–35 month old cohort were underweight and about 10 percent were wasted. There was no statistically significant difference between the treatment and control areas in the likelihood of being underweight or wasted (Figures 10.4 and 10.5). Average weight-for-age and weight-for-height z-scores were also similar in the treatment and control areas at endline. Similar to the impacts on stunting, the pattern of impacts on underweight and wasting for the full 0–35 month old sample were similar to those for the 24–35 month old sample.

**FIGURE 10.4 UNDERWEIGHT AMONG CHILDREN 24–35 MONTHS OLD**



Source: Baseline and endline caregiver surveys  
 Sample size: 917 caregivers (baseline); 4,515 caregivers (endline)

**FIGURE 10.5 WASTING AMONG CHILDREN 24–35 MONTHS OLD**



Source: Baseline and endline caregiver surveys  
 Sample size: 916 caregivers (baseline); 4,512 caregivers (endline)

**Anthropometric outcomes varied substantially by province and by socio-demographic characteristics, but there is little evidence that the Project led to systematic improvements for any of these subgroups.** Focusing on the full sample of 0–35 month old children at endline, the overall endline stunting rate in treatment areas was about 28 percent. This endline rate was substantially higher in Central Kalimantan and West Kalimantan (33 and 31 percent, respectively) compared to South Sumatra (23 percent). Stunting rates were also higher for older children, children in households in lower wealth quintiles, and children of less-educated mothers, but were similar for male and female children.

In addition to examining differences in endline levels of anthropometric outcomes across these subgroups, we also examined whether impacts varied by subgroup. Across the provincial and socio-demographic subgroups that we considered, only a handful experienced statistically significant impacts on stunting; the same was true for underweight and wasting. The few significant impacts did not follow any clear pattern and the difference in impacts across categories were not statistically distinguishable from zero (for example, we could not reject the hypothesis that there was no difference in stunting impacts across wealth quintiles or wasting impacts across provinces). Overall, these findings provide little evidence that the Project systematically affected stunting or other anthropometric outcomes for the subgroups that we considered.

**The Project did not substantively reduce the probability of low birthweight.** At endline, about 15 percent of children 24–35 months old in the treatment group were born with a low birthweight when measured by a combination of self-reports and buku KIA and KMS, and a similar share qualify as low birthweight when measured by the books alone. The rate of low birthweight was 2 percentage points lower than in the control group using books and self-reports; however, this impact was small, only marginally statistically significant, and was close to zero when measured by books alone, the more reliable measure.

Similarly, for the full sample of 0–35 month old children, there was a small statistically significant impact of negative 2 percentage points when measured by self-reports or books, which was driven by the impact in South Sumatra (negative 5 percentage points). However, the overall difference was smaller and no longer statistically significant when measured by books alone, and the difference in impacts across provinces is not statistically significant. Overall, these findings suggest that the Project did not substantively impact low birthweight.<sup>95</sup>

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<sup>95</sup> Low birthweight is driven by two factors: (1) preterm births and (2) being small for gestational age (WHO 2014b). We measured the former in our endline survey, by measuring gestational age, but did not measure the latter. The Project had no impact on preterm births as measured by gestational age.

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## 11. COST-BENEFIT ANALYSIS

In this chapter, we conduct a cost-benefit analysis (CBA) of the Nutrition Project to assess the extent to which the Project's benefits were commensurate with its costs. The CBA largely follows the approach described in our revised evaluation design report (Beatty et al. 2019). Specifically, we estimate the economic benefits of the Project—which we argue are likely driven by reductions in maternal, neonatal, and child mortality—and estimate several summary cost-benefit measures. These measures include the economic rate of return (ERR), which is the measure that MCC uses to guide its investments. We also assess the sensitivity of the ERR estimate to the underlying CBA model and explore reasons for differences with the ERR estimate produced at the start of the Project (Cameron et al. 2013b).



### KEY FINDINGS FROM THE COST-BENEFIT ANALYSIS

- The only economic benefit stream of the Project was reduced mortality as a result of impacts on maternal and child health outcomes.
- However, these benefits were limited; the economic rate of return of the Project was close to zero percent.

### 11.1 Economic benefits of the Nutrition Project

There are several potential economic benefit streams of the Nutrition Project. Below, we argue that the only stream that likely materialized in practice involves reductions in maternal, neonatal, and child mortality as a result of improved health outcomes during pregnancy and early childhood. We estimate these mortality reductions—in terms of the number of lives saved—using our estimated impacts on health outcomes, drawing on relationships between these outcomes and mortality from the health literature that are incorporated into software designed for this purpose. We then convert the estimated number of lives saved into an estimated total dollar benefit.

#### 11.1.1 Economic benefit streams

In planning for the CBA, we identified several potential economic benefit streams for the Nutrition Project, which are highlighted in the literature on the benefits of early childhood nutrition interventions (for example, Alderman and Behrman 2006; Martinez and Fernández 2008; Nandi et al. 2016) and are the same as the streams in the original CBA for the Nutrition

Project (Cameron et al. 2013b). (Appendix C summarizes the relevant literature.) These potential benefit streams are as follows:<sup>96</sup>

- **Reduced maternal, neonatal, and child mortality**, resulting from improved health outcomes during pregnancy and early childhood.
- **Reduced childhood morbidity** from diarrhea and other infectious diseases, resulting from improved health outcomes in early childhood and improved sanitation, which could result in economic benefits through decreased costs of care and treatment by children’s caregivers.
- **Increased income in adulthood** as a result of improved average child height-for-age (closely related to a reduction in stunting), which could result in increased educational attainment, cognitive ability, and productivity (see, for example, McGovern et al. 2017; Hoddinott et al. 2013; Victora et al. 2008; Adair et al. 2013).<sup>97</sup>

As shown in earlier chapters of this report, the endline study found little impact on diarrhea morbidity or on child height-for-age. However, we did find impacts on some health outcomes, including IFA consumption, breastfeeding behavior, and child immunizations, which could result in mortality reductions. Therefore, the CBA focuses exclusively on the mortality benefits.

### 11.1.2 Estimating mortality benefits using LiST

To estimate the mortality benefits of the Project—in terms of the number of lives saved—we used the Lives Saved Tool (LiST),<sup>98</sup> which was developed by the Johns Hopkins Bloomberg School of Public Health. LiST is a model that estimates the impact of scaling up health and nutrition interventions on maternal, newborn, and child mortality. It has been used for over a decade and is regularly updated to incorporate the latest evidence from the health literature.

The detailed steps that we implemented to estimate the lives saved as a result of the Nutrition Project using the LiST model are presented in Appendix C. In brief, these steps involved the following: (1) using LiST to project the size of the cohorts of pregnant women and young children in Project areas during the intervention period based on population data for these

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<sup>96</sup> Generasi included two indicators related to education, and some of the block grants provided to communities were used for education-related expenditure. Therefore, increased school enrollment—which could eventually translate into increased educational attainment and wages in adulthood—is another potential economic benefit stream. However, the evaluation is not measuring this benefit stream directly, and a separate recent long-term evaluation of Generasi found no significant impacts on enrollment (Olken et al. 2018). Therefore, we did not consider education benefits in the CBA.

<sup>97</sup> We ignored the potential for decreased chronic disease morbidity in adulthood because the evidence on the links between birth outcomes and child nutrition in low- and middle-income countries is limited (Victora et al. 2008), the findings from the few available studies are mixed, and the benefits would only accrue many years in the future and would thus contribute little to the CBA due to discounting (Alderman 2013). (In any case, our endline study found little impact on child undernutrition, the main channel for these benefits.)

<sup>98</sup> <http://livesavedtool.org/>

areas;<sup>99</sup> (2) setting reference parameter values for key coverage indicators (maternal and child health outcomes) based on estimated control means at endline; and (3) updating post-reference parameter values of those coverage indicators based on estimated endline impacts for indicators that showed statistically significant impacts at the 10 percent level or better. After updating the LiST parameters, we ran the model to estimate the number of lives saved each year, by coverage indicator.<sup>100</sup>

The LiST estimates suggest that the Project led to averting about 5 maternal deaths and 307 child deaths (Table 11.1). The handful of maternal deaths averted were due to improved IFA supplementation, which reduces the risk of mortality due to hemorrhaging around the time mothers give birth. Most of the child deaths averted were due to improved age-appropriate breastfeeding (primarily through reduced risk of diarrhea, pneumonia, and measles), and improved measles vaccination rates (driven by children 24–35 months old at endline).

### 11.1.3 Estimating the economic benefits of lives saved

To estimate the economic benefits of the lives saved we used the human capital approach, which focuses on the benefits for the productivity of the economy, for which wages serve as a proxy. (In Appendix C we discuss an alternative approach, the Value of a Statistical Life (VSL) approach, which we use below as a sensitivity check of our main findings.) Specifically, we allocated the lives saved each year across cohorts<sup>101</sup> and assumed that children whose lives were saved will eventually work between ages 15 and 60. For the small number of mothers whose lives were saved, we assumed they would be working between the ages of 29, their average age in the endline survey, and 60.

To estimate annual wages we used data on average national wages in Indonesia (ILO 2019) to estimate an average annual base wage of \$2,298 in 2017 (expressed in 2013 dollars to match the cost data below), which would experience a real annual growth rate of 4 percent in subsequent years.<sup>102</sup> (For those who will not work, these wages could be interpreted as an opportunity cost;

<sup>99</sup> These include: (1) the 95 treatment kecamatan in the three evaluation provinces that are included in the evaluation sample, (2) an additional 35 treatment kecamatan in these provinces that were not included in the evaluation sample, and (3) 359 kecamatan in the other eight provinces where the Project was implemented.

<sup>100</sup> Some coverage indicators in LiST affect mortality directly, as well as indirectly through their effects on stunting and wasting. Because we did not identify any positive impacts on stunting and wasting, we used the “direct entry of stunting and wasting” option to close this channel and estimate lives saved based on the direct channel only.

<sup>101</sup> Because LiST does not disaggregate lives saved each year by cohort, we allocated child lives saved equally across all the endline cohorts born at that point. For immunization, we assigned all lives saved to the cohort born in 2016, which was the only cohort that showed significant impacts. Given that these benefits will only begin to occur more than a decade in the future, we do not expect these simplifications to substantively affect the CBA estimates.

<sup>102</sup> According to the ILO, the average monthly wage in Indonesia was about 2,433,701 Rupiah in 2017 (ILO 2019), which translates into an average annual wage of \$2,298 (in 2013 dollars) after adjusting for the inflation rate between 2013 and 2017 (IMF 2019) and converting to dollars using the average exchange rate in 2013 (Bank of Indonesia 2019). The average real wage (that is, after adjusting for inflation) grew by 4 percent between 2008 and 2017 (ILO 2019), which is the assumption we use for future wage growth (this is the same assumption used in the original CBA).

therefore, we did not consider employment rates in our analysis.) Table 11.2 shows that the estimated present value of these benefits is about \$3.7 million after discounting using a discount rate of 10 percent, as recommended by MCC for developing countries (MCC 2017).

**TABLE 11.1 ESTIMATES OF LIVES SAVED FROM THE LIVES SAVED TOOL**

Coverage indicator	Cause of death averted	Number of lives saved						Total
		2016	2017	2018	2019	2020	2021	
<b>Total maternal lives saved</b>		<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>
IFA supplementation	Antepartum or postpartum hemorrhaging	0	0	5	0	0	0	5
<b>Total child lives saved</b>		<b>6</b>	<b>134</b>	<b>140</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>307</b>
Early initiation of breastfeeding <sup>a</sup>	Neonatal sepsis	4	3	7	0	0	0	14
	Neonatal pneumonia	2	1	3	0	0	0	6
Age-appropriate breastfeeding <sup>a</sup>	Diarrhea	0	17	24	0	0	0	41
	Pneumonia	0	38	43	0	0	0	81
	Meningitis	0	6	7	0	0	0	13
	Measles	0	18	22	0	0	0	40
	Pertussis	0	3	3	0	0	0	6
DPT vaccine	Pertussis	0	9	2	1	1	1	14
Measles vaccine	Measles	0	39	29	8	8	8	92

Source: LiST estimates

Note: We ignore a small number of child lives saved due to changes in the prevention of mother-to-child transmission of HIV and treatment of children with HIV. Although the former has some relationship with breastfeeding, which the Nutrition Project did affect, the estimated lives saved depend primarily on projections of improved HIV treatment coverage from UNAIDS, which are pre-programmed into the model and are unrelated to the Project.

<sup>a</sup> Although impacts on these indicators only affected coverage starting in 2017, the LiST output indicates that a small number of lives were saved in 2016. This is because children who were less than one month old in 2017 would have been born in later 2016, and thus experienced mortality reductions in that year due to early initiation of breastfeeding and exclusive breastfeeding.

Using the average annual wage across Indonesia—which includes urban areas where better-paying formal jobs are likely to be more common—might overstate wages for this rural population. In the endline survey, the median annual wage across all household members who reported one was only \$1,340 in 2018 (expressed in 2013 dollars), more than 40 percent lower than our assumed value. However, given the potential for urban migration by children whose lives were saved in future years, the Indonesia average might serve as a reasonable approximation. Further, even with these potentially overestimated earnings, the overall benefits of the Project are very small relative to the Project's costs (see below); therefore, the conclusions would not be substantively affected by further adjusting them down. Similarly, we do not take into account that some of the children whose lives were saved will not survive into adulthood, as these small adjustments would not substantively affect our conclusions.

**TABLE 11.2 NUTRITION PROJECT BENEFITS (2013 DOLLARS)**

Cohort	Lives saved	Working years	Total wages
Mothers	5	2018–48	708,960
Children born 2016	142	2031–75	6,839,1460
Children born 2017	112	2032–76	56,100,352
Children born 2018	53	2033–77	27,609,343
<b>Total (undiscounted)</b>			<b>152,810,115</b>
<b>Total present value (discounted to 2013)</b>			<b>3,676,077</b>

Source: Authors' calculations

## 11.2 Comparing Project costs and benefits

In this section we calculate the Project costs and compare them to the benefits calculated above to estimate summary cost-benefit measures, including the ERR.

### 11.2.1 Project costs

Table 11.3 shows the estimated costs of the Nutrition Project by year, which include direct costs and the Project's share of Compact overhead. The present value of the costs is almost \$108 million, using the recommended discount rate of 10 percent.

**TABLE 11.3 NUTRITION PROJECT COSTS (2013 DOLLARS)**

Year	Project costs	Project's share of Compact overhead <sup>a</sup>	Total costs
2013	22,464,008	2,805,865	25,269,873
2014	12,295,309	1,535,745	13,831,054
2015	16,424,745	2,051,532	18,476,277
2016	31,237,016	3,901,658	35,138,674
2017	29,623,807	3,700,160	33,323,967
2018	8,157,418	1,018,902	9,176,320
<b>Total (undiscounted)</b>	<b>120,202,303</b>	<b>15,013,862</b>	<b>135,216,165</b>
<b>Total present value (discounted to 2013)</b>			<b>107,971,905</b>

Source: Authors' calculation based on cost estimates provided by MCC.

<sup>a</sup>The Project's share of overhead costs was not reported by year; therefore, we allocated the total across years in proportion to the share of Project costs incurred each year.

### 11.2.2 Comparing benefits and costs

We used the estimates benefits and costs to compute three different cost-benefit measures:

1. The **net present value** of the investment, defined as the discounted sum of net benefits (benefits minus costs) in each period, is **negative \$104,295,828**.
2. The **benefit-cost ratio**, defined as the ratio of the present value of the benefits and the present value of the costs is **0.03**.
3. The **ERR**, defined as the interest rate at which the net present value is equal to zero, is **about zero percent**.<sup>103</sup>

These measures suggest that the Project's benefits were not commensurate with its costs—the net present value is negative, the benefit-cost ratio is substantially less than one, and the ERR is below the MCC hurdle rate of 10 percent, below which it does not consider investments to be economically worthwhile.

### 11.2.3 Sensitivity analysis

It is important to conduct additional sensitivity checks of the CBA results to the parameters used. Typical sensitivity analyses rely on simulations to assess the likely distribution of the estimated summary measures, by systematically varying the value of inputs to the CBA. However, given the near-zero ERR estimate in this context, we focus instead on trying to identify potential upper bounds for the ERR—that is, what the ERR would be under the most optimistic assumptions. We use two main approaches to estimate these upper bounds: (1) using the current human capital framework, but with more optimistic impact estimates; and (2) using the VSL framework describe in Appendix C, which places a value on reduced mortality in terms of broader societal welfare (beyond just improved economic productivity). (As above, all the estimates in this section are expressed in 2013 dollars.)

For the first approach, we re-ran the LiST model using the upper bound of the 95 percent confidence interval for each statistically significant impact estimate. The number of lives saved increased to 8 maternal lives and 704 child lives—more than double the estimates in the base model. This translates into a present value of economic benefits of \$8,349,364 and an ERR of about 2 percent. (See Appendix C for details.) Therefore, the ERR is not very sensitive to the estimates used and is still very small even in a substantially more optimistic impact scenario.

For the second approach, we required an estimate of the VSL—the value placed by society on each life saved—which is not available for Indonesia (or most developing countries). We use the recommendations of Robinson et al. (2019) to calculate the VSL for Indonesia as \$430,568, by

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<sup>103</sup> Because the undiscounted value of the benefits is greater than the undiscounted values of the costs, the ERR is positive, but it is very small (less than 0.1 percent). This suggests that the Project would only have been economically worthwhile if net benefits that occur many decades in the future were valued the same way as net benefits that occur today.

extrapolating from the Organisation for Economic Co-operation and Development (OECD), and \$837,978, by extrapolating from the US. (See Appendix C for details.) We then applied these VSL estimates to the number of lives saved from LiST (Table 11.1). The OECD extrapolation results in a present value of benefits of \$86,097,471 and an ERR of 5 percent, and the U.S. extrapolation results in benefits of \$167,564,208 and an ERR of 21 percent. Thus, the ERR estimates are sensitive to shifting the VSL approach, although the OECD estimates are still below the MCC hurdle rate of 10 percent. However, given the high sensitivity of these estimates to the VSL used, as well as the other concerns noted earlier about the VSL approach, we view these estimates as highly speculative.

### 11.3 Comparison to the original CBA

The original CBA (Cameron et al. 2013b) resulted in an estimated ERR of 16 percent, which is substantially higher than the ERR of close to zero estimated above. The original CBA was similar conceptually to that presented in this chapter; in planning for our CBA, we planned to include the same major benefit streams, which were appropriate for the Project as designed. However, the ERR estimates are substantially different, for the following reasons:

- **Key activities driving the original ERR estimate were not implemented, or faced major challenges.** In the original CBA the intervention-level ERRs were highest for the sanitation and the micronutrient interventions; these ERRs were 262 percent and 79 percent, respectively. However, as we note in Chapter 1, the micronutrient intervention was not implemented at all, and the sanitation intervention faced major challenges and fell short of some key monitoring targets.
- **Fewer cohorts were exposed to the Project activities than anticipated.** The original CBA assumed that the Project's activities would be implemented without delay, resulting in four years of full implementation. Thus, it was assumed that two cohorts of children would have full exposure over the full window spanning the in utero period up to age 23 months and four cohorts would have partial exposure either in the early or late part of the window. The original CBA estimated that each cohort would include about 290,000 children, which implies that about 580,000 children would have had full exposure and 1,160,000 would have had partial exposure (to the full package of Project interventions, but only in part of the window).<sup>104</sup> However, we showed in Chapter 1 that several activities were delayed and that the envisaged synchronicity between activities largely did not materialize in practice. Therefore, as we show in Chapter 3, only one cohort (children 24 to 35 months old at endline) can be considered to have had full exposure, with limited exposure for other cohorts. Based on the population data we used for the CBA, we estimated this cohort to include about 370,000 children; another two, younger cohorts in our evaluation sample, comprising about

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<sup>104</sup> The original CBA assumed that Generasi would only be implemented in 3 of the 11 implementation provinces, so only about 70,000 children per cohort would be exposed to Generasi. The original ERR might have been even higher if it had correctly assumed that Generasi would be implemented in all 11 provinces.

740,000 children, would have had partial exposure (only to some Project interventions).<sup>105</sup> As a result, the number of children potentially benefitting from the Project was lower than originally anticipated, limiting the benefits of the project.

- **The largest benefit streams in the original CBA did not materialize.** The three benefit streams that made the largest contributions to the original ERR estimate were (1) the productivity gains from reduced low birthweight and stunting, (2) earnings generated by those who would have died due to diarrhea, and (3) cost savings in the form of decreased health care costs from reduced diarrhea morbidity. The first and third of these benefit streams largely did not manifest, and the second occurred to a much smaller extent than expected (as suggested by the relatively few lives saved due to averted diarrhea mortality in Table 11.1). The limited reductions in diarrhea-related morbidity and mortality might be related to the cancellation of the micronutrient intervention and challenges with the sanitation interventions, which were driving these reductions in the original CBA.

Overall, the difference between the original CBA and that presented in this chapter is simply because Project impacts fell short of initial expectations. This is in large part due to the implementation challenges discussed in Chapter 1, which led to there being fewer potential beneficiaries and lower impacts, and applied especially to the activities that were expected to have the largest economic benefits.

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<sup>105</sup> As we show in Chapter 3, a fourth cohort (children 36–47 months old at endline) could also have experienced partial exposure, but was not included in our evaluation sample. (Mostly because it would have been difficult to measure their health behaviors accurately given possible recall errors.) However, it is highly unlikely that including this additional cohort of 370,000 children would have substantively changed the estimated ERR because (1) the impacts of the Project even on the cohort with full exposure were limited, and (2) we showed above that our ERR estimate is not sensitive to large changes in the estimated number of lives saved.

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## 12. CONCLUSION

This report presented endline impacts of the Nutrition Project based on data collected roughly one year after the end of the Project's five-year implementation period. In this concluding chapter, we reflect on these impacts in the context of the original program logic, which identified pathways that were expected ultimately to lead to a reduction in child stunting. In each section below we show the relevant level of the logic model and the conditions that needed to take place in order for the Project to realize the outcomes at the next-highest level in the logic model.

### Outputs

We start with the output level in Figure 12.1 that covers the most proximate results from implementation.

**FIGURE 12.1 LOGIC MODEL OUTPUTS**



Figure 12.2 shows conditions that needed to take place for the training to affect short-term outcomes in the logic model and whether they took place. (In this and other similar figures, we highlight conditions that were met in dark green and conditions that were moderately met in light green.) On the positive side, as we show in Chapter 1, MCA-I met nearly all training targets. Focusing on the providers who were the primary audience for each training, 62 percent of bidan in treatment areas were trained in IYCF, 58 percent of nutritionists were trained in growth monitoring, and 78 percent of sanitarians were trained in CLTS, according to endline survey data. The training rates were higher than in control areas by 41, 15, and 24 percentage points, respectively. Thus the gap between providers trained in the treatment and control groups was the largest for IYCF; it was markedly smaller for CLTS and growth monitoring training. In-terms of intensity, training in treatment areas was universally slightly longer, by about a day for CLTS and IYCF training and two days for growth monitoring training.

Looking at other measures that could reflect training quality, IYCF, growth monitoring, and CLTS trainings in treatment areas tended to cover a more comprehensive range of topics and use more innovative teaching methods. There is also some evidence from our 2018 interim report that the trainings in treatment areas (mostly funded by MCA-I, especially the IYCF training, were higher quality than those in control areas. We found that training participants at all cascade levels gained new and in-depth knowledge of training topics. For bidan and kader posyandu, the IYCF training focused heavily on one-on-one counseling, or how the service providers could improve methods of advising women during patient appointments or informal interactions about, for example, a healthy pregnancy, troubleshooting breastfeeding challenges, or appropriate

complementary feeding strategies. The main shortcoming with these trainings was that these providers did not receive much guidance about how to conduct nutritional group counseling sessions (kelas ibu hamil and kelas balita), a critical mechanism for delivering messages covered in the training. For CLTS, the training solidly covered the core CLTS pillars, the multifaceted nature of CLTS, and the importance of effective communication. But participants felt that the training did not sufficiently cover the triggering steps, specifically how to interact with the community and persuade them to participate in the triggering and to carry out triggering steps like the transect walk or explain disease contamination pathways.

**FIGURE 12.2 CONDITIONS OUTPUTS NEEDED TO MEET IN ORDER TO AFFECT SHORT-TERM OUTCOMES AND WHETHER THOSE CONDITIONS WERE MET**

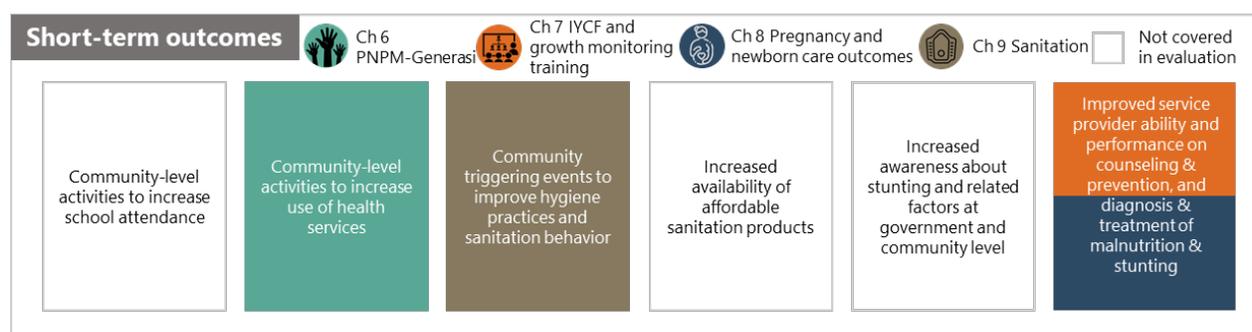
Conditions for affecting short-term outcomes	Conditions met?	Explanations
Training prevalence greater than control	Somewhat	41 percentage points for bidan (IYCF) 24 percentage points for sanitarians (CLTS) 15 percentage points for nutritionists (GM)
Training duration greater than control	Somewhat	+1 day for IYCF and CLTS +2 days for GM
Training was higher quality in treatment than in control	Somewhat	More comprehensive topics IYCF cascade relatively successful. New info delivered. Lots of attention to 1-on-1 counseling, yet participants not trained on how to conduct counseling sessions. (I) CLTS training content, especially regarding how to conduct triggering, could have been more detailed. (I)

(I) Indicates interim report finding

Looking at the other outputs that the evaluation did not cover, MCC monitoring data discussed in Chapter 1 show that these activities mostly produced expected outputs: Generasi block grants were disbursed, Generasi facilitators and kader received a stunting module as part of their training, the communication campaign was implemented as planned, and puskesmas received anthropometric kits. Two exceptions were that the sanitation grant-making activity was scaled back to be much more modest than planned and implemented later than planned, and the IFA was distributed to kabupaten health offices but later than expected.

### *Short-term outcomes*

Next we look at the Project's effect on short-term outcomes shown in Figure 12.3 and whether progress on those outcomes, summarized in Figure 12.4, was sufficient to affect medium-term outcomes.

**FIGURE 12.3 LOGIC MODEL SHORT-TERM OUTCOMES**

The picture on short-term outcomes is mixed. The short-term Generasi outcomes are positive—all Generasi desa undertook health-related activities, including activities that supported health access and use. Also positive, in terms of sanitation, was that the Project moderately increased the percent of desa triggered in treatment areas relative to control areas (by 16 percentage points).

We examined two aspects of provider effectiveness (the blue box in Figure 12.3). First, we used knowledge as a proxy for the “provider ability and performance on counseling” aspect of the logic model. The effects of the increased training participation and quality on provider knowledge—a key channel through which the training could affect maternal and child health outcomes—were limited. For IYCF, knowledge improved modestly on a handful of metrics for kader posyandu; less so for bidan, bidan coordinators, and nutritionists, possibly because their knowledge levels were already high at baseline. For example, the Project didn’t affect bidan coordinators’, nutritionists’ or bidan’s knowledge about the adverse effects of stunting, because it was already over 90 percent at baseline; but improved it by 24 percentage points for kader posyandu, the provider for which it was lowest at baseline. (As shown in Figure 7.7, the training covered a wide range of topics; asking about all these topics would have been burdensome for respondents given the length of the provider surveys. Therefore, we only asked providers a very limited number of questions about topics covered in the training. It is possible that knowledge improved on other topics we did not ask about.) For growth monitoring, knowledge about the age up until which a child should be measured lying down—a fundamental component of length taking—improved somewhat (by 12 percentage points) for nutritionists but not for bidan coordinators.

Second, we found that diagnosis, also mentioned in the logic model, was weak with only 33 percent of underweight children and 8 percent of stunted children diagnosed as such even after they were weighed/measured at the posyandu. The last channel through which training could affect maternal and child health outcomes according to the logic model was improved provider ability to treat patients, which we did not measure. However, the focus of the growth monitoring trainings regarding treatment for stunting—and the methods commonly mentioned by providers—were providing supplementary food and counseling about diet changes, whereas the only method known to be effective is lipid-based nutrient supplementation (LNS). This is not

necessarily a failing of the trainings' ability to impart knowledge but rather a potential flaw in training content.

Although not explicitly mentioned in the logic model, we look at households' access to services, as this follows from the Generasi short-term outcome "community-level activities to increase the use of health services." There were modest Project-driven improvements in some outcomes in this area: posyandu participation increased, a greater share of children in some age groups were weighed and had their length taken, and more caregivers participated in nutrition counseling sessions (although overall participation levels were low). In contrast, there was no difference in the share of women with the recommended number of pre- or post-natal checkups. Among children and/or caregivers who received checkups, went to the posyandu, or attended nutritional counseling sessions, there was no change in the frequency.

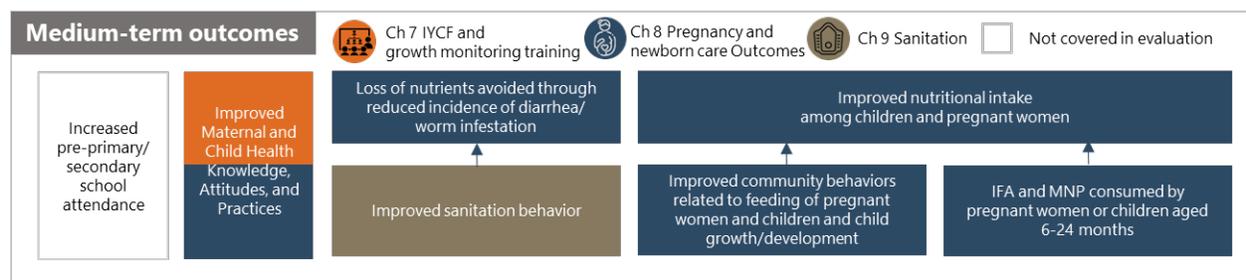
**FIGURE 12.4 CONDITIONS SHORT-TERM OUTCOMES NEEDED TO MEET IN ORDER TO AFFECT MEDIUM-TERM OUTCOMES AND WHETHER THOSE CONDITIONS WERE MET**

Conditions for affecting medium-term outcomes	Conditions met?	Explanations	Adjusted impact
Community-level (Generasi) activities to increase use of health services implemented	Yes	46 percent of Generasi desa supported transport for high-risk pregnancies and deliveries	
		82 percent of Generasi desa supported health and nutritional counseling	
		88 percent of Generasi desa supported incentives for kader posyandu and contract bidan	
Improved household access to services	Somewhat	Women received 4+ prenatal checkups	80% 2
		Women received 3+ postnatal checkups	18% 0
		0-11 m.o. received 3+ postnatal checkups	23% 3
		0-11 m.o. went to posyandu last 6 mo	85% 7***
		12-35 m.o. went to posyandu last 6 mo	77% 11***
		0-11 m.o. weighed last year	98% 0
		12-35 m.o. weighed last year	93% 3***
		0-11 m.o. length taken last year	78% -3
		12-35 m.o. length taken last year	65% 11***
		Women ever attended a kelas ibu hamil	29% 8***
Women ever attended a kelas balita	16% 7***		
Improved service provider performance on counseling (using knowledge as proxy)	Somewhat	CLTS: no impact	
		IYCF: some for kader posyandu; little for bidan, bidan coordinators, nutritionists GM: yes for nutritionists, no for bidan coordinators	
Improved service provider performance on diagnosis of undernutrition	No (diagnosis), Don't know (counseling, prevention, treatment)	Underweight children who went to posyandu and were weighed were told they were underweight	33% -1
		Stunted children who went to posyandu and were measured were told they were stunted	8% -5
		We did not collect data on service provider counseling, prevention, or treatment	
Triggering events occurred	Yes	74 percent of desa were triggered	
Triggering events occurred with greater frequency than in control	Somewhat	+16pp in T	

### Medium-term outcomes

Now we turn to the medium-term outcomes shown in Figure 12.5 and discuss below and in Figure 12.6 whether changes here were sufficient to impact the long-term outcomes.

FIGURE 12.5 LOGIC MODEL MEDIUM-TERM OUTCOMES



Progress at the medium-term outcome level was very limited. The most positive findings at this outcome level are some improvements on IFA consumption during pregnancy, breastfeeding behavior, and nutritional intake for children. The Project improved IFA consumption by 9 percentage points, although a small share of women (less than a quarter) consumed at least 90 IFA pills. There was an impact on exclusive breastfeeding (9 percentage points), but not early initiation; and an impact on minimum meal frequency (8 percentage points), but not minimum dietary diversity for children. The Project had no impacts on sanitation behavior or diarrhea incidence. The larger impacts on breastfeeding and complementary feeding behaviors relative to sanitation behavior could in part reflect the larger impacts on provider training rates for IYCF compared to CLTS, as discussed earlier.

Caregiver knowledge of some topics like early initiation of breastfeeding and stunting improved, but these improvements were very small and unlikely to have an effect on long-term outcomes. Indeed, the Project improved exclusive breastfeeding rates and some aspects of complementary feeding, but we do not think this was a result of these knowledge improvements, as these impacts were again quite small. It is possible that knowledge improved and we failed to ask the appropriate questions that led to the improved breastfeeding or complementary feeding results, and/or the impacts on breastfeeding and complementary feeding could reflect improvements in other channels besides knowledge, such as improved one-on-one counseling skills or changes in community attitudes (neither of which were measured by the evaluation).

We examined Project impacts on all key outcomes by subgroups, including those defined by socioeconomic status, caregivers' education, children's gender, and service availability, as well as by province and cohort. Although there were some substantive differences in impacts across certain subgroups for certain outcomes (beyond those one would expect by chance), we did not identify any patterns that suggested that impacts were systematically different for particular subgroups.

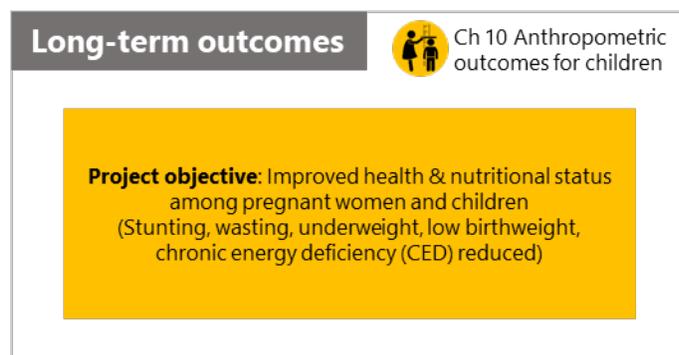
**FIGURE 12.6 CONDITIONS MEDIUM-TERM OUTCOMES NEEDED TO MEET IN ORDER TO AFFECT LONG-TERM OUTCOMES AND WHETHER THOSE CONDITIONS WERE MET**

Conditions for affecting long-term outcomes	Conditions met?	Explanations	Adjusted impact
Improved maternal and child health knowledge	No	Significant but very small impacts for questions related to early initiation, EBF, handwashing, stunting We did not collect data on attitudes	
Communities ODF	No	Desa ODF	21% 5
Reduced incidence of diarrhea	No	0-5 m.o. diarrhea in last 2 weeks	7% -4
		0-35 m.o. diarrhea in last 2 week	14% 0
Improved maternal and child health practices Improved nutritional intake among children and pregnant women	Somewhat	0-23 m.o. early initiation	55% 4
		0-5 m.o. EBF (WHO)	45% 9**
		6-35 m.o. EBF (since birth)	24% 4**
		6-23 m.o. minimum dietary diversity	41% 2
		6-23 m.o. minimum meal frequency	64% 9***
		6-23 m.o. minimum acceptable diet	28% 5**
		12-35 m.o. received complete immuniz.	67% 2
Women consumed 90+ IFA pills	23% 9***		

### Long-term outcomes

Finally, we look at whether the Project affected the long-term outcomes (stunting, wasting, underweight, and low birthweight) shown in Figure 12.7, and attempt to explain these findings.

**FIGURE 12.7 LOGIC MODEL LONG-TERM OUTCOMES**



Consistent with the modest (at best) impacts on medium-term outcomes, the Project had no impact on long-term outcomes. We propose several reasons for this:

**Implementation delays limited synchronicity between activities.** The Project expected that all activities would synchronize to affect cohorts of children for the 1,000 days between conception and age 2. As we showed in Chapters 1 and 3, many of the training delays meant that this synchronicity didn't occur. Generasi was primarily implemented from 2015 to 2017, while much

of the training took place in 2017 or later. For example, half of bidan and nutritionists were trained in 2017 when Generasi was starting to wind down.

**There were weaknesses in CLTS training content, similar trainings in control areas, and limited effectiveness of triggering in achieving ODF status.** Turning to CLTS implementation, although the MCA-I-funded trainings covered more topics and used more innovative methods than other CLTS trainings, our 2018 interim study (Beatty et al. 2018) showed that the training content could have been more detailed, especially regarding a fundamental component of the model—how to conduct triggering sessions. Moreover, the high fraction of CLTS training in the control areas limited the contrast with the treatment areas. There was also a program logic breakdown between triggering and ODF—75 percent of desa were triggered but only 21 percent were ODF. This could be either because the triggering was not well implemented (due to the weak training or other implementation barriers); because communities did not respond to it; or because the effects of the triggering hadn't materialized by the time of the endline data collection. Regardless of the reasons behind this lack of impact, we would not expect child diarrhea to be greatly reduced when OD rates are still quite high.

Moreover, by endline, several studies had shown that there was no association between improved water quality, sanitation, and handwashing and linear growth, calling the Project's theory of change that CLTS would affect stunting (Luby et al. 2018, Null et al. 2018, Humphrey et al. 2019). Even if the Project had been able to improve OD and reduce diarrhea, it is not clear that this would have had an effect on stunting.

**The frequency of contact between providers and clients were limited and the Project did not substantially improve this.** As mentioned in the interim study and above, the IYCF training implementation was stronger (than CLTS) and achieved greater contrast with the control group in terms of training prevalence (in addition to being longer, more comprehensive, and using more innovative teaching methods). However, impacts on maternal and child health behaviors targeted by IYCF trainings were modest. We hypothesize that the IYCF training did not result in larger impacts because the Project did not induce more pre- or post-natal visits, or much more contact with the posyandu through posyandu visits or nutritional counseling sessions. The mean number of checkups was six for prenatal checkups and two for postnatal checkups (among the nearly 100 percent of women who received at least one prenatal checkup and 63 percent of women who received at least one postnatal checkup), which offers limited opportunities for one-on-one counseling (especially for behaviors related to breastfeeding and complementary feeding, which require postnatal interactions). Further, despite the Project's significant efforts to improve nutritional counseling sessions and modest positive impacts on session attendance, only 30 percent of women ever attended kelas ibu hamil and half as many ever attended kelas balita. Even among those who attended, on average they attended only three times which is again a very limited amount of time to change behaviors.

This was another breakdown in the program logic—Generasi did not have the envisaged effects on the demand side of services, perhaps because it did not sufficiently address the barriers to service access. These communities might have needed greater incentives, improved convenience, and/or improved access to be able to significantly increase contact with providers who were

trained in IYCF. It is possible that Generasi was not designed to deliver this level of contact or that it was not implemented to its full potential.

**The Project was implemented against a backdrop of great national momentum towards reducing stunting and widespread improvements in key maternal and child health indicators.** This was one of the explanations of the Olken et al. 2018 report—that Generasi did not show impacts after nine years because there was “significantly less room for improvement in many Generasi target areas.”

Improving maternal and child health outcomes, including stunting, is a major national priority. Indonesia joined the scaling up nutrition (SUN) movement in 2011, a coalition of governments, civil society, the United Nations, donors, businesses and researchers working to improve nutrition (Scaling Up Nutrition 2015). Several years later, in 2015, Indonesia began a National Food and Nutrition Action Plan for 2015–19, a framework for addressing nutrition (WHO 2019). More recently, in 2017, President Widodo launched a 2017–21 National Strategy to Accelerate Stunting Prevention and committed an estimated US\$3.9 billion per year for interventions related to health, water and sanitation, early childhood education, social protection, and food security (Rokx et al. 2018).

Consistent with these efforts, maternal and child health conditions are improving. The 2018 Riskesdas results show a national reduction in stunting from 37 percent to 31 percent from 2013 to 2018 (Riskesdas 2018). This study also reveals a similar trend—we see a reduction in the control group from 43 to 36 percent in the 24–35 month olds from 2014 to 2019. Other proximal outcomes are also improving. For example, 40 percent of women in the control group delivered at a facility at endline, up from 24 percent at baseline, and 83 percent of women received any IFA during pregnancy, up from 72 percent at baseline. However, even in the context of these achievements, there is still a great deal of room for improvement in many indicators, as evidenced by the Project’s positive impacts on behaviors such as IFA consumption, exclusive breastfeeding, and feeding frequency.

### *Concluding thoughts and recommendations*

Overall, the Project had the *potential* to improve outcomes and proved it did in some cases, even in the context of improving conditions. It did not fully achieve its potential for reasons common to many development projects: some unrealistic expectations in the program logic, implementation delays, implementation roll-out challenges, and insufficient community response to what was implemented. Although the Nutrition Project had limited success, we hope that other initiatives implemented under the National Stunting Strategy can learn from MCA-I’s and MCC’s successes and challenges. Here are some thoughts about lessons for future research and interventions related to stunting, based on our findings.

1. **Understand reasons for the decline in stunting.** It is remarkable that stunting has declined in Indonesia. In this study, it declined by 7 percentage points for the 24-36 month age group from 2014 to 2019. It is likely that the Government of Indonesia is already planning to study the reasons for the decline. If not, it would be very useful to explore whether the decline was

due to a national policy, macroeconomic improvements, a targeted policy or project, or due to other factors. Related, it is not only important to understand reasons for the overall decline but also why the Riskesdas results show a decline mostly in severe but not moderate stunting.

2. **Focus on expanding postnatal care.** According to our study, approximately 68 percent of mothers of 0-11 month-olds had received any postnatal care and just 18 percent received three postnatal visits in the first six weeks after delivery, as recommended by the World Health Organization (WHO). The first four to six weeks are a particularly vulnerable time for mothers and babies and thus monitoring their health is critical during this time. If the Government wants to continue to make this a priority, it likely needs to expand efforts to increase access to postnatal care, as it has with prenatal care. (In contrast, 77 percent of mothers meet the four prenatal care visits target.)
3. **Understand and replicate the Nutrition Project's efforts related to exclusive breastfeeding.** One of the most impressive achievements of this Project was that it resulted in a 9 percentage point improvement in exclusive breastfeeding for mothers of 0-5 month-olds (using the WHO definition of exclusive breastfeeding). We hypothesize that this may be due to the infant and young child feeding training for bidan, kader posyandu, and puskesmas staff, which taught recommended breastfeeding practices and techniques for counseling women on breastfeeding challenges; but we recommend further study related to how this outcome improved so that other provinces outside of Kalimantan Barat, Kalimantan Tengah, and Sumatera Selatan can consider replicating this successful effort to improve exclusive breastfeeding.
4. **Consider how long it takes time for communities to become ODF and the effectiveness of STBM.** We found that only approximately 20 percent of desa that had been "triggered," a critical step in STBM implementation, between 2014-19 were open-defecation free (ODF) by 2019. This means that either it takes some time for triggering to translate into ODF; or that STBM may be less effective than hoped in helping desa to become ODF. We recommend that The Ministry of Health further explore the effectiveness in STBM in mitigating open defecation and how to overcome barriers faced by communities in becoming ODF.
5. **Design programming with an appreciation that many households with access to sanitation infrastructure still openly defecate.** A small share of households (12 percent) do not have access to latrines, yet many households (a quarter) with any kind of latrine reported openly defecating in the last week. Openly defecating was lowest among households with an improved, private, latrine. These findings suggest that (a) improving sanitation infrastructure improves behavior; but (b) access to sanitation alone is not sufficient to change behavior. This underscores the importance of supporting effective behavior change interventions.
6. **Reconsider kelas ibu hamil and kelas balita implementation.** We found that the Project had a positive impact on posyandu holding kelas ibu hamil and kelas balita and on women attending these classes. Although this is positive, it is important to note that even in Project areas, only 30 percent of women ever attended kelas ibu hamil and half as many ever attended kelas balita. Many women did not know about the classes or said the time and venue

were not convenient for them. Given this low attendance despite significant Project effort, the Government could consider another method of delivering class content. It could consider another time, venue, or different forum for delivering the important content of these classes.

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