

# An evaluation of the common application system (CAS) for Anganwadi workers in India

<b>Submission date</b> 03/11/2016	<b>Recruitment status</b> No longer recruiting	<input checked="" type="checkbox"/> Prospectively registered <input checked="" type="checkbox"/> Protocol
<b>Registration date</b> 08/12/2016	<b>Overall study status</b> Completed	<input type="checkbox"/> Statistical analysis plan <input checked="" type="checkbox"/> Results
<b>Last Edited</b> 21/07/2025	<b>Condition category</b> Other	<input type="checkbox"/> Individual participant data

## Plain English summary of protocol

Current plain English summary as of 31/07/2018:

### Background and study aims

Community health workers, such as Anganwadi workers (AWWs) in India, are an important workforce in low- and middle-income countries with unmet potential for providing care. Although AWWs have achieved many successes, there is a great potential for AWW effectiveness to be improved through the use of mobile technology. There is very little existing research on the causal effects of Monitoring and Information Systems on maternal, infant or child outcomes in developing countries. Existing research in low- and middle-income countries has mostly focused on the use of technologies to track the attendance and punctuality of health and primary education, but there is not much evidence on how these technologies affect health outcomes. Therefore, there is a significant research gap in the understanding of how monitoring and information technologies affect community health worker behavior, efficiency and effectiveness, and how these technologies ultimately affect health outcomes in the community. The Ministry of Women and Child Development in India developed a technology-based intervention to improve service delivery at Anganwadi Centers, ensure better supervision of the Integrated Child Development Services (ICDS) scheme and enable data based decision making. This technology intervention is called the Common Application Software (CAS) and is intended to be a job aid for Anganwadi Workers (AWWs). The goal of the CAS intervention is to strengthen the Integrated Child Development Scheme (ICDS) system and capacities, improve work profile and efficiency of Anganwadi workers, and improve timeliness and appropriateness of ICDS services to the beneficiaries in the short term. Eventually, such improvements in ICDS can lead to term better health and nutrition outcomes for children and mothers. The aim of this study is to test the overall impact of the CAS intervention on AWW knowledge and service delivery to pregnant women, lactating mothers and children <12 months, describe and assess technology and process of the programme to understand potential factors that are associated with program's success and failures, and provide suggestions for potential scale-up of the program

### Who can participate?

Pregnant women, mothers and children living in participating areas, Anganwadi Workers (AWWs), Supervisors of AWWs, ICDS officials and other government officials.

What does the study involve?

Participating Anganwadi centers are chosen from the intervention and control districts. In the intervention consists of CAS as job aid, monitoring and data driven decision making tool as described previously. The control group of Anganwadi centers do not receive the intervention but continue to receive standard training, capacity building and infrastructure improvement support under a broader government programme aimed at strengthening the ICDS called ICDS Systems Strengthening & Nutrition Improvement Program. The primary outcomes are related to service delivery by the AWW to pregnant women and mothers of children <12m in terms of adequate number of home visits and appropriate messaging and counselling to beneficiaries by the AWW because ICDS-CAS App is expected to improve these with minimal dependence on any external facilitating factors. The secondary outcomes are several and relate to ICDS functioning, and motivation, knowledge and practices of the AWW in the upstream to the primary outcomes, and improvements in the other ICDS services such as growth monitoring and supplementary nutrition which are dependent on external factors such as timely and sufficient supplies. At the beneficiary levels the secondary outcomes relate to knowledge and practices of the beneficiaries served by the AWWs. Aspirational outcomes which are measured but are not anticipated to change in the study time period are related to health and nutrition of mother and child. These outcomes are measured before and after the intervention is complete and compared between the intervention and control groups to assess if there is any improvement because of the ICDS-CAS intervention in ICDS service delivery.

What are the possible benefits and risks of participating?

There are no direct benefits involved with participating. Some study participants might experience some stress while answering interview questions which can collect personal information, check health records and involves height and weight measurement of children.. However, potential for any harm is negligible because the questions are standard and common in many India based surveys, and the participants will have a right to refuse answer to any or all questions. Study participants will not have to bear any financial cost, and there will be no physical requirements.

Where is the study run from?

The study is run from University of California, San Francisco, NEERMAN, and the International Food Policy Research Institute and takes place in approximately 850 Anganwadi centers in the states of Bihar and Madhya Pradesh (India)

When is the study starting and how long is it expected to run for?

January 2016 to July 2019

Who is funding the study?

Bill and Melinda Gates Foundation (USA)

Who is the main contact?

Miss Carol Hui  
carolhui@berkeley.edu

Previous plain English summary as of 06/07/2018:

Background and study aims

Community health workers, such as Anganwadi workers (AWWs) in India, are an important workforce in low- and middle-income countries with unmet potential for providing care. Although AWWs have achieved many successes, there is a great potential for AWW effectiveness to be improved through the use of mobile technology. There is very little existing research on the causal effects of Monitoring and Information Systems on maternal, infant or

child outcomes in developing countries. Existing research in low- and middle-income countries has mostly focused on the use of technologies to track the attendance and punctuality of health and primary education, but there is not much evidence on how these technologies affect health outcomes. Therefore, there is a significant research gap in the understanding of how monitoring and information technologies affect community health worker behavior, efficiency and effectiveness, and how these technologies ultimately affect health outcomes in the community. The Ministry of Women and Child Development in India developed a technology-based intervention to improve service delivery at Anganwadi Centers, ensure better supervision of the Integrated Child Development Services (ICDS) scheme and enable data based decision making. This technology intervention is called the Common Application Software (CAS) and is intended to be a job aid for Anganwadi Workers (AWWs). The goal of the CAS intervention is to strengthen the Integrated Child Development Scheme (ICDS) policy framework, system and capacities, and facilitate community engagement, to improve the health of children less than six years of age; and strengthen convergent actions for improved nutrition outcomes. The aim of this study is to test the overall impact of the CAS intervention on AWW knowledge and service delivery to pregnant women and lactating mothers and children <12 months, and to describe and assess technology and process of the programme to understand potential factors that are associated with explaining program's success and failures, and provide suggestions and solutions for potential scale-up of the program.

#### Who can participate?

Pregnant women, mothers and children living in participating areas, Anganwadi Workers (AWWs), supervisors of AWWs, ICDS officials and other government officials.

#### What does the study involve?

Participating Anganwadi centres are chosen from the intervention and control districts. The intervention consists of CAS as job aid, monitoring and data driven decision making tool as described previously. The control group of Anganwadi centers do not receive the intervention but continue to receive standard training, capacity building and infrastructure improvement support under a boarder government programme aimed at strengthening the ICDS. The primary outcomes are related to service delivery by the AWW to pregnant women and mothers of children <12 months in terms of adequate number of home visits, appropriate messaging and counselling to beneficiaries, and growth monitoring of children <12 months. The secondary outcomes related to knowledge and practices of the AWW, and knowledge and practices of the beneficiaries served by the AWWs. Aspirational outcomes which are measured but are not anticipated to change in the study time period are related to health and nutrition of mother and child. These outcomes are measured before and after the intervention is complete and compared between the intervention and control groups to assess if there is any improvement because of the ICDS-CAS intervention in ICDS service delivery.

#### What are the possible benefits and risks of participating?

There are no direct benefits involved with participating. Some study participants might experience some stress while answering interview questions which can collect personal information, check health records and involves height and weight measurement of children. However, the potential for any harm is negligible because the questions are standard and common in many India based surveys, and the participants will have a right to refuse answer to any or all questions. Study participants will not have to bear any economic cost, and there will be no physical requirements.

#### Where is the study run from?

850 Anganwadi centers in the states of Bihar and Madhya Pradesh (India)

When is the study starting and how long is it expected to run for?

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Community health workers, such as Anganwadi workers (AWWs) in India, are an important workforce in low- and middle-income countries with unmet potential for providing care.

Although AWWs have achieved many successes, there is a great potential for AWW effectiveness to be improved through the use of mobile technology. There is very little existing research on the causal effects of Monitoring and Information Systems on maternal, infant or child outcomes in developing countries. Existing research in low- and middle-income countries has mostly focused on the use of technologies to track the attendance and punctuality of health and primary education, but there is not much evidence on how these technologies affect health outcomes. Therefore there is a significant research gap in the understanding of how monitoring and information technologies affect community health worker behavior, efficiency and effectiveness, and how these technologies ultimately affect health outcomes in the community. The Ministry of Women and Child Development in India developed a technology-based intervention to improve service delivery at Anganwadi Centers, ensure better supervision of the Integrated Child Development Services (ICDS) scheme and enable data based decision making. This technology intervention is called the Common Application Software (CAS) and is intended to be a job aid for Anganwadi Workers (AWWs). The goal of the CAS intervention is to strengthen the Integrated Child Development Scheme (ICDS) policy framework, system and capacities, and facilitate community engagement, to improve the health of children less than six years of age; and strengthen convergent actions for improved nutrition outcomes. The aim of this study is to test the overall impact of the CAS intervention on AWW behaviors, knowledge and time use, describe potential pathways for explaining program success and failures, and provide suggestions and solutions for potential scale-up of the program.

Who can participate?

Pregnant women, mothers and children living in participating areas, Anganwadi Workers (AWWs) and their assistants, ICDS officials and other government officials.

What does the study involve?

Participating Anganwadi centers are allocated to either be intervention centres or control centres. In the intervention centres, Anganwadi workers receive an Android-platform phone with an application (CAS) specifically designed to help them register participants and prioritize activities. In the control centres, Anganwadi workers receive no phone and proceed with standard care using a paper-based system. In both groups, the time taken to record key patient information is compared. In addition, the growth and weight of children being treated by Anganwadi workers are measured at the start of the study and one year later.

What are the possible benefits and risks of participating?

There are no direct benefits involved with participating. Some study participants might experience some stress while answering interview questions. This might be more true with women in rural India, who are generally not allowed to speak with people outside of their

immediate family. However this is an extremely low degree of potential harm. Study participants will not have to bear any economic cost, and there will be no physical requirements.

Where is the study run from?

The study is run from International Food Policy Research Institute and takes place in Anganwadi centers in Bihar and Madhya Pradesh (India)

When is the study starting and how long is it expected to run for?

January 2016 to July 2018

Who is funding the study?

Bill and Melinda Gates Foundation (USA)

Who is the main contact?

Miss Carol Hui

carolhui@berkeley.edu

## Contact information

**Type(s)**

Scientific

**Contact name**

Miss Carol Hui

**Contact details**

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Berkeley

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## Additional identifiers

**EudraCT/CTIS number**

**IRAS number**

**ClinicalTrials.gov number**

**Secondary identifying numbers**

NA

## Study information

**Scientific Title**

# Effects of a mobile technology based mHealth intervention on service delivery under the Integrated Child Development Scheme of India: a quasi-experimental mixed methods evaluation

## Study objectives

Current study hypothesis as of 06/07/2018:

The aim of this study is to:

1. Evaluate the effectiveness of the ICDS-CAS intervention which assists community health workers (known as Anganwadis) perform key functions within the India's Integrated Child Development Scheme (ICDS) framework on service delivery to pregnant women, mothers and children <12 m.
2. Assess the pathways of impact (process) and CAS technology with a aim to understand potential for successes and failure when implemented at-scale

Previous study hypothesis:

The aim of this study is to:

1. Evaluate the effectiveness of a Common Application Software (CAS) intervention which assists community health workers (known as Anganwadis) perform key functions within the India's Integrated Child Development Scheme (ICDS) framework
2. Assess the CAS intervention's impact on the outreach and effectiveness of Anganwadi workers (AWW), Anganwadi helpers and AWW supervisors.
3. Assess the impact CAS has on health outcomes in women and children and on their knowledge and practices related to health and nutrition

## Ethics approval required

Old ethics approval format

## Ethics approval(s)

University of California, Berkeley, Ref. No. 2016-08-9092, India-based Suraksha Independent Ethics Committee, Protocol No. 2016-08-9092 - 29/03/2017

## Study design

Multi-centre non-randomized study

## Primary study design

Interventional

## Secondary study design

Non randomised study

## Study setting(s)

Community

## Study type(s)

Other

## Participant information sheet

No participant information sheet available

## Health condition(s) or problem(s) studied

Maternal and child health

## **Interventions**

Current interventions as of 06/07/2018:

Anganwadi centers will be selected from treatment areas (which are determined by the Indian government); each Anganwadi center has one Anganwadi worker and is overseen by a supervisor who has approx. 20 Anganwadi centers in her cluster. Comparison centers will be selected from the control area where ICDS-CAS is not being implemented currently but will be implemented in future.

Intervention group: Anganwadi workers in treatment groups will receive an Android-platform phone with an application (CAS) specifically designed to help them register participants and prioritize activities. The supervisors and higher ICDS officials will either get a smart phone or web-based tool to monitor AWW performance. Other support such as training, help-desk, etc will be provided. Intervention group will also continue to receive the standard infrastructure improvement and capacity building support provided to the control group.

Control group: Under a standard ICDS strengthening and improvement programme, the control group will receive upgrades to the ICDS infrastructure and training of the AWW and their supervisors as per the incremental learning approaches.

Previous interventions:

Anganwadi centers will be selected from treatment areas (which are determined by the Indian government); each Anganwadi center has one Anganwadi worker and is overseen by a supervisor who has 20 Anganwadi centers in her cluster. Comparison centers will be selected from which the control sample will be selected.

Intervention group: Anganwadi workers in treatment groups will receive an Android-platform phone with an application (CAS) specifically designed to help them register participants and prioritize activities.

Control group: Anganwadi workers receive no phone and will proceed with the standard of care, which is a paper-based system.

## **Intervention Type**

Mixed

## **Primary outcome measure**

Current primary outcome measure as of 31/07/2018:

To assess the effectiveness of ICDS-CAS compared to the standard ISSNIP and ICDS, the following were assessed:

1. The proportion of pregnant women and mothers of children <12 months who received adequate number of home visits by the AWW in 3 months
2. The proportion of pregnant women and mothers of children <12 months who received appropriate extent or level of counselling from the AWW during their interactions (at home, at AWCs, or in other settings) in 3 months

Previous primary outcome measure as of 06/07/2018:

The proportion of ICDS beneficiaries (pregnant & lactating women with children <12 months) who receive appropriate number of home visits and appropriate counselling messages from the Anganwadi workers as per ICDS guidelines; and the proportion of children who receive adequate level of growth monitoring services (weighing, and counselling on nutritional status) from the Anganwadi workers.

Previous primary outcome measure:

Time use in minutes spent recording key patient information on CAS app compared to recording the information by hand is measured using photographic and video technology, as well as a survey asking about time use in the past 24 hours at baseline and endline, as well as some qualitative data that will be collected throughout the process.

### **Secondary outcome measures**

Current secondary outcome measures as of 06/07/2018:

1. Knowledge of AWWs on topics including birth preparedness, breastfeeding, complementary feeding, and family planning
2. Knowledge of mothers on topics including birth preparedness, breastfeeding, complementary feeding and family planning
3. Practices of mothers around birth preparedness, antenatal care, delivery care, infant and young child feeding practices, family planning, and immunization

Previous secondary outcome measures:

1. Child growth is measured using stadiometers and infantometers at baseline and 1 year
2. Child weight is measured using weighing scales at baseline and 1 year

### **Overall study start date**

01/09/2016

### **Completion date**

01/07/2019

## **Eligibility**

### **Key inclusion criteria**

Current participant inclusion criteria as of 31/07/2018:

1. Pregnant women
2. Mothers of children
3. Children < 60 months of age
4. Anganwadi workers (AWWs)
5. Lady supervisors of the AAWs
6. Other ICDS officials
7. Other government officials and private stakeholders

Previous participant inclusion criteria as of 06/07/2018:

1. Pregnant women
2. Mothers of children <24 months of age
3. Children <60 months of age
4. Anganwadi workers (AWWs)
5. Lady supervisors of the AAWs
6. Other ICDS officials
7. Other government officials and private stakeholders

Previous participant inclusion criteria:

1. Pregnant women
2. Mothers
3. Anganwadi Workers (AWWs)



4. AWW assistants
5. ICDS officials
6. Children
7. Other government officials

**Participant type(s)**

Mixed

**Age group**

Mixed

**Sex**

Both

**Target number of participants**

More than 800 villages with approx. 6000 women and children, 800 AWWs, 100+ lady supervisors, 20+ ICDS officials, 10+ government and other private stakeholders

**Key exclusion criteria**

Current participant exclusion criteria as of 06/07/2018:

1. Non-beneficiaries of the Anganwadi center
2. Not registered to receive ICDS service

Other exclusions criteria may exist as per sampling plan such as excluding villages which are too small or urban areas.

Some beneficiaries of ICDS service may also be excluded - adolescent girls and children under 72 months.

Previous participant exclusion criteria:

No exclusion criteria

**Date of first enrolment**

01/01/2017

**Date of final enrolment**

08/01/2019

**Locations****Countries of recruitment**

India

United States of America

**Study participating centre**

International Food Policy Research Institute

Dev Prakash Shastri Marg

Pusa

New Delhi  
India  
110012

**Study participating centre**

**UCSF**

550 16th Street  
San Francisco  
United States of America  
94158

**Study participating centre**

**UC Berkeley**

2199 Addison Street  
Berkeley  
United States of America  
94720

**Study participating centre**

**NEERMAN**

Mahendra Industrial Coop. Soc.  
Road No. 29. Sion (East)  
Mumbai  
India  
400022

## **Sponsor information**

**Organisation**

Bill & Melinda Gates Foundation

**Sponsor details**

500 Fifth Avenue North  
Seattle  
United States of America  
98109

**Sponsor type**

Charity

**Website**

www.gatesfoundation.org

**ROR**

<https://ror.org/0456r8d26>

## **Funder(s)**

**Funder type**

Charity

**Funder Name**

Bill and Melinda Gates Foundation

**Alternative Name(s)**

Bill & Melinda Gates Foundation, Gates Foundation, BMGF, B&MGF, GF

**Funding Body Type**

Government organisation

**Funding Body Subtype**

Trusts, charities, foundations (both public and private)

**Location**

United States of America

## **Results and Publications**

**Publication and dissemination plan**

Current publication and dissemination plan as of 06/07/2018:

Planned publication in a peer-reviewed journal.

Previous publication and dissemination plan:

Planned publication in a high-impact, peer-reviewed journal.

**Intention to publish date**

01/07/2021

**Individual participant data (IPD) sharing plan**

The current data sharing plans for the current study are unknown and will be made available at a later date.

**IPD sharing plan summary**

Data sharing statement to be made available at a later date

**Study outputs**

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Protocol article</a>	protocol	27/03/2019	31/03/2020	Yes	No
<a href="#">Other publications</a>	Analysis of association between level of supervision provided to community healthcare workers and their performance	27/11/2021	29/11/2021	Yes	No
<a href="#">Other publications</a>		22/01/2022	24/01/2022	Yes	No
<a href="#">Results article</a>		01/07/2022	15/07/2022	Yes	No
<a href="#">Other publications</a>	AWW time use	07/12/2020	18/01/2024	Yes	No
<a href="#">Other publications</a>	qualitative interview study of perspectives of community health workers and beneficiaries	15/01/2020	18/01/2024	Yes	No
<a href="#">Other publications</a>		13/11/2024	20/11/2024	Yes	No
<a href="#">Other publications</a>	This study used secondary data from an endline survey to evaluate the effectiveness of an mHealth intervention to digitally enable AWWs	18/07/2025	21/07/2025	Yes	No