

Exploring the Applicability of a Rapid Health Assessment in India

Claudia Carbajal, Jija Dutt, Smriti Pahwa, Sumukhi Vaid, Karishma Vats

Abstract—ASER Centre, the research and assessment arm of Pratham Education Foundation sees measurement as the first stage of action. ASER uses primary research to push and give empirical foundations to policy discussions at a multitude of levels. At a household level, common citizens use a simple assessment (a floor-level test) to measure learning across rural India. This paper presents the evidence on the applicability of an ASER approach to the health sector. A citizen-led assessment was designed and executed that collected information from young mothers with children up to a year of age. The pilot assessments were rolled-out in two different models: Paid surveyors and student volunteers. The survey covered three geographic areas: 1,239 children in the Jaipur District of Rajasthan, 2,086 in the Rae Bareilly District of Uttar Pradesh, and 593 children in the Bhuj Block in Gujarat. The survey tool was designed to study knowledge of health-related issues, daily practices followed by young mothers and access to relevant services and programs. It provides insights on behaviors related to infant and young child feeding practices, child and maternal nutrition and supplementation, water and sanitation, and health services. Moreover, the survey studies the reasons behind behaviors giving policy-makers actionable pathways to improve implementation of social sector programs. Although data on health outcomes are available, this approach could provide a rapid annual assessment of health issues with indicators that are easy to understand and act upon so that measurements do not become an exclusive domain of experts. The results give many insights into early childhood health behaviors and challenges. Around 98% of children are breastfed, and approximately half are not exclusively breastfed (for the first 6 months). Government established diet diversity guidelines are met for less than 1 out of 10 children. Although most households are satisfied with the quality of drinking water, most tested households had contaminated water.

Keywords—Citizen-led assessment, infant and young children feeding, maternal nutrition, rapid health assessment supplementation, water and sanitation.

I. INTRODUCTION

THE Human Development Index (HDI) measures three dimensions of human development: a long and healthy life, access to knowledge and having a decent standard of living. In 2015, India ranked 131 out of 188 countries, placing the country in the range of medium human development [1]. Between 1990 and 2015, India's HDI value increased 45.7%, reflecting improvements in the three dimensions [2]. In terms of nutrition indicators, India almost doubled the rate of stunting reduction in the last ten years compared to the previous decade. Although the rate of decline in child

Claudia Carbajal is with Pratham Education Foundation USA.

Smriti Pahwa was with ASER Centre. She is now an independent consultant.

Jija Dutt, Sumukhi Vaid and Karishma Vats* are with Pratham Education Foundation – ASER Centre, India (*e-mail: karishma.vats@gmail.com).

undernutrition accelerated since 2006, India is below the rates of progress required to reach the global nutrition targets adopted by the World Health Assembly (WHA) [3].

With the objective of providing actionable indicators, ASER Centre at Pratham Education Foundation is exploring the applicability of the ASER approach to health. The ASER approach is a simple, easy to replicate and administer, low cost and citizen-led method that involves communities in data collection of learning outcomes and uses the findings to influence the education policy debate. Similar to the mentioned metrics, the ASER health survey would involve a rapid health assessment of relevant health indicators which would be administered frequently enough so as to help provide relevant inputs into the design and implementation of the national level health policy landscape.

This paper presents the first stage of a research project that focuses on children younger than one year old and their mothers and explores topics of infant and maternal nutrition and supplementation, water and sanitation and growth monitoring. The structure of the paper is the following: i) the ASER approach is presented in detail, ii) the ASER-health approach conceptualization and process to design the first attempt to replicate this method in health are presented, iii) the results of the rollout of this survey in Uttar Pradesh, Rajasthan and Gujarat are described, and iv) the path for next steps is discussed.

II. DESCRIPTION OF THE ASER APPROACH

The Annual Status of Education Report (ASER) is a household survey conducted by ASER Centre, Pratham's autonomous research and assessment unit. ASER is the only annual source of information on children's learning. ASER provides information on children's schooling status as well as their ability to read simple text and do basic arithmetic. Children aged 3-16 years from almost every rural district in India are covered [4].

ASER is a citizen-led survey. Since 2005, each year, ASER has worked with around 500 partner organizations and over 25,000 volunteers across India to roll out the survey. The partners are varied and include colleges, universities, NGOs, youth groups, women's organizations and self-help groups. ASER creates a space for local communities to participate in acknowledging the poor learning issues in primary education and has the potential of catalysing actions at community level. This approach also contributes to making ASER a large scale yet low cost survey. According to an external evaluation conducted in 2013-2014, ASER survey costs around US \$1.5 per child [5]. Similar, citizen-led initiatives have been taken

up in 14 countries in Asia, Africa and North America [6].

In order to include all children and generate representative and inclusive estimates of basic learning in rural India, ASER visits households instead of schools to apply the survey. This design enables ASER to include children that i) have never been to school, ii) have dropped out, iii) are enrolled in any type of school and attend school regularly, iv) are enrolled in any type of school but do not attend school regularly [7].

ASER surveys all rural districts in the country. ASER has a two-stage sample design within each district. First, 30 villages are randomly selected from the census village and then 20 households are randomly selected from the village ensuring that the households are selected from all sections of the village. Villages are selected using the probability proportional to size (PPS) sampling method. The procedure uses the left-hand 5th household rule, a sampling technique developed for this survey. Starting in a central location of a hamlet, every 5th household to the left is selected. All children in the selected households in the age group 3-16 are surveyed on school status and those aged 5-16 are tested. This allows having a random selection with a strictly defined rule that is replicable in every village at a low cost [8].

ASER is done every year to present estimates at the district, state and national levels. Given its annual nature and comparability of tools and methodology overtime, ASER also presents trends over time to see how learning outcomes, enrolment and other education-related variables evolve over time. This provides an opportunity for short-term policy intervention. The rationale behind is that long gaps between assessments are lost opportunities to take corrective action.

III. TOWARDS AN ASER APPROACH IN HEALTH

The Social Sector Unit at ASER Centre has been exploring the applicability of the ASER approach within the health sector in India. The objective is to find a simple and replicable methodology that allows large scale assessments led by citizens in relevant health topics, in order to provide measurements that can lead to changes in policy and practice.

In 2015, the Bill and Melinda Gates foundation supported an exploratory study to assess the value and feasibility of ASER-health [9]. This project brought together experts from the field of policy, implementation and research to review the status of health reports and indicators and a potential way to move forward with ASER-health. Four priorities were defined i) identify specific domains in the health sector that are suitable for innovative measurements, ii) generate tools and indicators that are simple but descriptive and easy to understand, iii) enable the involvement of common citizens in generating evidence, and iv) construct indicators that are relevant for policy making.

The first part of the process identified the approach and areas that ASER health should cover. Existing programs, guidelines and research documents were reviewed to understand the current scenario of health indicators. Sources reviewed included programs like the Integrated Child Development Scheme (ICDS), policies like National Iron+ Initiative, guidelines on enhancing optimal IYCF practices by

Ministry of Health and Family Welfare (MoHFW), among others. Additionally, existing surveys on health like Rapid Survey On Children (RSOC), National Family and Health Survey (NFHS-4), Alive and Thrive, International Food Policy Research Institute (IFPRI), Partnership and Opportunities to Strengthen and Harmonize Action for Nutrition in India (POSHAN), District Nutrition Profiles (DNP) were reviewed.

A differentiating factor between ASER and ASER-health is that when ASER started, the data available on education outcomes in India were limited, while there are many sources that provide information related to the health sector. The salient feature of the ASER-health is that the survey brings the focus of the health debate to the 'practices' that people follow. The goal is to understand health behaviours and focus on the reasons behind those behaviours. This provides inputs to policymakers to improve the design and implementation of health interventions by addressing the key constraints or challenges identified from the practice perspective and not only from the provision perspective.

In order to address the identified priorities, a framework was developed to guide the design of the survey tool and narrow the topic coverage. The framework relies on three pillars that are complementary for understanding health topics and provide a more precise picture of the issue and the factors around it. The pillars are knowledge, practice and access to services.

- *Knowledge*: What do people know about the health issue of interest? This pillar allows identifying gaps in the knowledge of the best practices.
- *Practice*: What do people do in their daily life? This component attempts to understand what are the concrete practices that households follow and the reasons behind those choices as well as how far they are from best practices.
- *Access*: Are people aware of the relevant services-policy provisions? Do they access them? This element provides inputs on awareness and level of participation in services and policy provisions. This component provides information on the reasons behind the access or lack of access of policy provisions.

The survey instrument used for this survey was piloted several times in different contexts. In the initial pilots, the tool focused on children less than two years old and their mothers. The tool covered diet assessment for mother and child, food adjustments made by mothers during pregnancy, antenatal check-ups, food and iron supplement during pregnancy, child's health services: iron syrup, weight, growth chart and immunization, salt testing, drinking water, hygiene and diarrhea. The tool was field tested in Rajasthan, Uttar Pradesh and Delhi to measure its strengths, weaknesses and areas of opportunity. After this pilot and conversations with different policy and research actors, the scope of the survey was narrowed to infant and young children feeding (IYCF) and the mother's nutritional practices during pregnancy. Maternal nutrition as well as water and hygiene were included in the survey to have a comprehensive picture of IYCF and collect information on the most relevant aspects that can influence

infant nutrition. The subtopics covered in the survey tool are food and feeding of young children, supplementation, immunization, growth monitoring, water, hygiene and diarrhea, maternal nutrition during pregnancy and linkage to health services. Additionally, the age bracket was reduced to less than one year old to reduce recall bias. During pilots it was observed that women would remember with greater clarity and precision the practices followed during pregnancy when their child was less than one year old and the quality of recall would reduce significantly as the age of the child increased.

One of the goals from the beginning of the project was to generate a survey instrument that is in line with the ASER approach. This implies having an instrument that is easy to understand by the surveyed person and easy to implement by the surveyor despite the complexity of the topics and questions covered. The survey tool was designed to be user friendly and be used by people with limited experience and training on health and surveying methods.

Similar to ASER, the survey followed a two-stage sampling design within each district. In the first stage, villages were randomly selected using the 2011 village directory as the sample frame. Villages were selected using PPS. This method allows villages with larger population to have a higher chance of being selected in the sample and ensures that children in larger villages have the same probability of being selected as those in the small villages.

The second stage of the sampling design that allows to select the households to survey was assessed in the early pilots. Early on, the method evolved from the traditional ASER education left hand 5th household rule to a village census. The left hand 5th household rule was not adequate for this project because of the narrow age of target children. Simply using the left hand 5th household rule would not give the adequate number of children and their mothers in the 0 to 12 months range.

To simplify the sampling strategy while ensuring a representative sample from the villages, a census was conducted in the selected villages. A roster of children up to one year old was collected from the Anganwadi Centres that are local centres for delivery of services within the ICDS¹. All mothers of children in that roster were surveyed. Children found in the village who were not in the roster were also included in the survey, including those who were temporarily residing in the village.

In 2017, the survey was rolled in three districts of different states purposively selected to explore different contexts and to take advantage of the existing ASER presence in the districts. Additionally, in Uttar Pradesh the district was selected to avoid interference with other projects of the Bill and Melinda Gates Foundation.

¹ Integrated Child Development Services (ICDS) is one of the flagship programmes of Government of India running since 1975. The beneficiaries of the scheme are children in the age group of 0-6 years, lactating mothers and pregnant women. The services offered under the scheme are pre-school education, supplementation, immunization, nutrition and health education, health check-up and referral services. All the services of the scheme are delivered through Anganwadi centres in the villages [11].

In August, 60 villages were randomly selected in Raebareli district in Uttar Pradesh and in Jaipur district in Rajasthan to be surveyed. This exercise was done with paid surveyors recruited and trained for this survey. Later, in December, 40 villages in Bhuj block in Gujarat were surveyed. This survey was done by trained volunteers from Krantiguru Shyamji Krishna Verma Kachchh University.

Rolling out the survey with two different kinds of surveyors was important to understand the training needed and the required profile of the surveyors. Relying on volunteers is a fundamental aspect of ASER since it allows the local community to get engaged and is suitable for scale since the costs remain low. ASER-health intends to follow the same methodology and engage local volunteers in the assessments. This exercise allowed understanding some of the aspects that are relevant for scale.

District level surveys in three different locations gave an idea of the diversity and helped develop a standardized tool. India is a diverse country and it was important to understand how the different social, cultural, geographical and environmental aspects influenced the rolling out of the survey.

IV. RESULTS

This section presents the results collected with the deployment of the survey. The sample analysed consists of 2,086 observations in Uttar Pradesh, 1,234 observations in Rajasthan and 593 observations in Gujarat. These results are representative at the district level in Uttar Pradesh and Rajasthan and at the block level in Gujarat. The results presented here are the most relevant findings in IYCF, maternal nutrition and water and sanitation.

A. Results on IYCF

Most children are breastfed, however only half are exclusively breastfed. The National Guidelines on Infant and Young Child Feeding [10] direct that during the first six months of life children should be exclusively breastfed. The positive result is that almost all children are breastfed. The data show that 97.6% (UP), 98.5% (RJ) and 98.8% (GJ) of children are breastfed. However, relatively few are exclusively breastfed, 50.6% (UP), 52.8% (RJ) and 60.5% (GJ).

Between seven and 12 months, most children engage in complementary feeding. Following the guidelines, 93.4% (UP), 92.8% (RJ) and 84.8% (GJ) are non-exclusively breastfed in the 7 to 12 months.

Water is the primary complement to breastfeeding. For more than a third of children, complementary feeding is limited to water. 92.4% (UP), 92.6% (RJ) and 92.6% (GJ) of children consume water. However, 41.0% (UP), 37.6% (RJ) and 31.6% (GJ) of children do not consume anything apart from mother's milk, water, medicines or supplements.

Minimum diet diversity guidelines are met for less than 1 out of 10 children. The diet guidelines state that children aged 7 to 12 months should consume at least four food groups. However, only 8.8% (UP), 3.0% (RJ) and 20.7% (GJ) of children receive at least four food groups.

Consumption of take home rations of Anganwadi food is

low. Only 23.1% (UP), 11.5% (RJ) and 50.2% (GJ) of children aged 6-12 months consumed food received from Anganwadi Centres. Food received from Anganwadi takes the form of *panjiri* flour in Rajasthan and fortified ready to cook food in Uttar Pradesh and Gujarat. There are large differences across locations in the reason for non-consumption. Supply might be driving the behaviour in Uttar Pradesh and Gujarat since the main reason is that they did not receive the food from Anganwadi Centre (61.9% UP, 21.9% GJ). In Rajasthan lack of awareness might be behind the non-consumption since the majority of mothers mentioned that the child is too young to consume Anganwadi food despite being older than six months (35.5%).

Increasing iron consumption is still a challenge, less than one in a hundred children consumes iron syrup according to national guidelines. National guidelines establish that iron syrup should be consumed twice per week for children aged 7-12 months [12]. Only 0.1% (UP), 0.5% (RJ) and 5.5% (GJ) of children consumed iron twice per week.

B. Results on Maternal Nutrition

Most women did not make any diet changes during pregnancy. The National Dietary Guidelines by the National Institute of Nutrition recommend increasing quantity and frequency of different food groups during pregnancy [13]. However, only a small proportion of women increased consumption of at least one these food groups (36.6% in UP, 20.0% in RJ, 21.4% in GJ). Conversely, some women decreased consumption of at least one of these groups (22.1% in UP, 10.3 in RJ, 30.7% in GJ).

Taste dislike and negative side effects were the main drivers of consumption reductions in food items. 65.8% (UP), 24.4% (RJ) and 20.3% (GJ) of women avoided a food group because of dislikeable taste. Side effects such as vomiting and dizziness were mentioned by 18.4% (UP), 24.4% (RJ) and 9.9% (GJ) of women.

Consumption of food from Anganwadi Centres during pregnancy is low. 48.5% (UP), 14.8% (RJ) and 49.1% (GJ) of women consumed food from Anganwadi Centres regularly during pregnancy. Awareness of the benefits of Anganwadi food during pregnancy presents large differences across different locations. In Uttar Pradesh and Gujarat, the main reason for consumption is that it is nutritious for both mother and child (60.2% in UP, 31.5% in GJ) while in Rajasthan the main reason is that it was advised by a government health worker (49.7%).

Regular consumption of IFA tablets by women during pregnancy is higher than Anganwadi take-home rations. 74.7% (UP), 50.6% (RJ) and 72.3% (GJ) of women consumed IFA tablets regularly during their pregnancy. Reasons for non-consumption vary across locations. In Uttar Pradesh the main reason for not consuming IFA tablets are the side effects (44.4%), in Rajasthan is that women did not feel the need for it (49.7%) and in Gujarat is that they did not like the taste (36.1%).

A majority of women considers that IFA supplementation during pregnancy is beneficial for both the mother and the

child. 73.6% in UP, 65.1% in RJ, 60.9% in GJ consider that IFA supplements are beneficial. There is a disconnection between knowledge and practice because even though a majority of women considers IFA tablets beneficial, not all of them consume IFA tablets regularly.

C. Results on Water, Sanitation and Diarrhea

Although most of the households are satisfied with the quality of drinking water, most drinking water is contaminated. 98.4% (UP) and 95.1% (RJ) of households are satisfied with the quality of drinking water. However, water is contaminated in 57.6% (UP) and 85.9% (RJ) of the households. Water testing was not done in Gujarat.

Less than a quarter of children drink purified water. Out of the children that drink water, 21.7% (UP), 17.8% (RJ) and 54.1% (GJ) drink purified water. The most common purification techniques are boiling (70.4% in UP, 17.45% in RJ, 45.9% in GJ), filtering with cloth (27.6% in UP, 51.5% in RJ, 33.0% in GJ) and the use of water filters (7.0% in UP, 15.2 in RJ, 15.2% in GJ).

Despite safe storage practices, water is often contaminated in the serving process. Storage of water in covered recipients (64.9% in UP, 95.7% in RJ, 74.4% in GJ) is the most common storage method. However, most of households serve water by dipping in their hand with another utensil such as a cup (68.3% in UP, 78.7% in RJ, 67.8% in GJ). This practice likely compromises the water's quality. A limited proportion of households serve water with the help of a ladle (9.5% UP, 19.5% in RJ, 15.3% in GJ).

Sanitation facility coverage is low. A third of households do not have a toilet in the house in Rajasthan and Gujarat, two thirds of households do not have a toilet in the house in Uttar Pradesh.

Financial reasons are the main cause given for not having a toilet in the household. Lack of money was the most cited reason for not owning a toilet (68.9% in UP, 77.5% in RJ, 58.0% GJ), followed by lack of government support (51.6% in UP and 18.1% in RJ, 50.0% in GJ).

High rates of open defecation are seen even among toilet owners. The data show that availability of toilets does not imply usage. 26.6% (UP), 10.0% (RJ) and 17.6% (GJ) of households own a toilet but have at least one member does not use it.

Number of households safely disposing child's faeces is low. According to the Water and Sanitation Program, safe disposal of faeces is to put or rinse child's faeces into a toilet or latrine [9]. Child's faeces are washed in a toilet in only 6.7% (UP), 34.5% (RJ) of cases, 45.4% (GJ). The most common practice is leaving children's faeces open (67.7% in UP, 52.4% in RJ, 30.2% GJ).

Understanding of diarrhea is higher in Rajasthan and Gujarat than in Uttar Pradesh. 33.1% (UP), 63.3% (RJ) and 52.1% (GJ) of caregivers know that diarrhea can be identified as liquid faeces for more than three times a day in their child.

Around a quarter of children had diarrhea in the two weeks previous to the survey. Diarrhea incidence was 17.9% in Uttar Pradesh, 24.1% in Rajasthan and 31.4% in Gujarat. Although

the concept of diarrhea was explained before asking this question, there seems to be a correlation between understanding what diarrhea is and identifying a diarrhea episode in a child.

Few households prevent dehydration when children have diarrhea. Diarrhea puts children at risk of dying due to dehydration. The main intervention to prevent death is early and appropriate fluid replacement. However, in cases of diarrhea, only 0.5% (UP), 1.7% (RJ) and 2.7% (GJ) of mothers gave ORS to the child, 0.5% (UP), 0.3% (RJ) and 1.1% (GJ) gave salt and sugar solution and 0.5% (UP), 0.0% (RJ), and 7.0% (GJ) gave homemade fluids. The most common practice followed when a child had diarrhea was to give medicines (62.3% in UP, 45.1% in RJ, 37.6% in GJ).

Two thirds of caregivers do not link children's diarrhea with sanitation conditions. Most mothers do not know what causes of diarrhea. In only 29.8% (UP), 21.8% (RJ) and 33.1% (GJ) of cases, mothers related eating contaminated food, drinking polluted water or unhygienic conditions as causes of diarrhea.

V. DISCUSSION

The results presented in the previous section shows that the interpretation of the questions as well as the practices, knowledge and access vary highly across locations. This was an expected outcome and is the reason why the states were selected purposively. Uttar Pradesh, Rajasthan and Gujarat present significant differences, ranking from levels of income, economic development, social empowerment and geographic location, customs and cultural context. These results are fundamental to understand the applicability of the ASER approach to health since the differences in local context need to be acknowledged and internalized in the process to make representative estimates at the national level. Since no technical expertise and minimum training are required to conduct the survey, this can be taken to scale to cover most states and districts of India like ASER in education does. ASER-health can become a reliable and annual source of data in health, infant and young child feeding to start with.

Currently there is a lack of health estimates at the community level but many policy interventions are implemented. By providing community level estimates, a policy-oriented survey such as ASER-health could play a significant role in decision-making at various levels including household and community. Such assessment would help the beneficiaries and local community to become the stakeholders and self-assess the key challenges at the community level and take necessary corrective actions to solve them at their own levels and capacities. Moreover, the enormous scale of health issues in India point that institutional solutions are helpful to advance the path but are not the only solution to health issues. The dimension of these issues requires the inclusion of families, and particularly caregivers in the design, implementation and scale up of health interventions.

VI. THE WAY AHEAD

The results and learning obtained in the first roll out of the survey were instrumental to define the strengths and weaknesses of this methodology, survey tool, sampling method and general approach. This learning is being used to strategize the future of the research project and define the approach that will be followed to improve the efficiency of the survey and establish conditions for scalability.

Some of the most relevant aspects that will be addressed in the next stages are:

1. Data quality - The first round of data collection presented in this document was designed to test the approach and survey tool. Moving forward, the objective is also to improve the quality of data collection through monitoring, recheck processes and digital data collection.
2. Sampling - The sampling strategy for this round of surveys was a census of the village in which all children from the Anganwadi list and the additional children found on the village were included. To maintain representativeness while improving efficiency, some alternative sampling techniques will be analysed.
3. Survey tool - The analysis of the results of the survey and the deployment provided inputs that can improve the wording of the questions and thereby, the accuracy to measure the intended variables. The immediate next task is to work on the survey tool and use these findings to improve the instrument. Additionally, it is important to make this tool simpler and shorter, to stay in line with the ASER education approach.
4. Partners - In order to conduct this survey at scale, partnering with the right kind of organizations and engaging the right people to carry out the survey is essential. Given the structure and scope of this survey, selecting the right partners will be key to taking the survey to scale. There is particular interest on working with universities and NGOs in India that have some knowledge of health and could improve the deployment of the project.
5. Dissemination - One important goal is to generate evidence that can place some of these issues into the policy debate. Although the first step is to generate actionable indicators, the second step requires creating a plan at the onset for who the information from this survey will be most useful for and how to reach them in the best way will be useful in planning out the overall survey plan.

VII. CONCLUSION

The health topic in India receives substantial attention and resources every year. Proof of that are the vast arrays of national and district-level health surveys that provide indicators in different health domains. These surveys are conducted by trained professionals provide aggregate-level information to policymakers at state and national level. However, the pace of change in health needs and the large scale of the challenge ahead require frequent and actionable indicators. This would reduce the gap between data collection

and space for policy change as well as the evolving topics of focus.

The objective of ASER-health is not to replace or replicate any existing health survey but to explore the feasibility of having simple measurements to provide actionable indicators more frequently. The major focus of the assessments is to identify the reasons behind each component of the practice-knowledge-access framework and describe the “why” in each practice domain to find out the potential actionable indicators. Given the survey design, the project has the potential to reveal gaps in knowledge, practice and access. These gaps have a massive space for impact in decision-making at multiple levels, depending on the needs of each issue and the approach followed.

Community involvement is one of the key elements of ASER surveys and it is also a national development priority. This study highlights the potential of simple measurements in creating an interface for discussion about food and health care practices with support from grassroots. The involvement of local volunteers without technical expertise is an opportunity to involve local communities on understanding the magnitude of the challenges and providing the elements to bring to the public debate the relevant issues found.

As in any exploratory study, this project faces challenges and limitations. Some of the most relevant are finding an efficient sampling method, generating effective monitoring and recheck systems and improving the quality of data collection and management. Thinking about going to scale, the learning of the first round of survey design and deployment will be used to redesign the survey tool and improve the structure and framing of the questions to have more precise indicators. Efforts will also be focused on designing a sampling method that preserves the representativeness with higher efficiency.

Going forward ASER-health could provide actionable indicators to the stakeholders at various levels and even become a relevant annual source of data. Frequent data could support keeping a track of progress made through planned interventions. The ASER-health approach to involve local volunteers and provide simple, understandable and actionable indicators could lead a way to large annual citizen led surveys as an alternative to the other existing health surveys with traditional survey designs.

ACKNOWLEDGMENT

Support (conceptual and financial) from the Bill and Melinda Gates Foundation throughout the project is deeply appreciated. Heartfelt thanks to ASER state teams for their support and cooperation in undergoing rounds of field visits and pilots. We would also like to thank Dr. Rukmini Banerji (CEO-Pratham), Dr. Wilima Wadhwa (Executive Director-ASER Centre) and Dr. Suman Bhattacharjea (Director-ASER Centre) and Prerna Makkar (Advisor-Social Sector Unit at ASER Centre) for their support and guidance during the survey design, dissemination and redesign. Last but not the least, our gratitude to all the volunteers and the mothers of young children in the communities who participated in the

study.

REFERENCES

- [1] UNDP. (2016). Human Development Report 2016, New York: United Nations Development Programme.
- [2] UNDP. (2016). *India Briefing Note*, New York: United Nations Development Programme.
- [3] International Food Policy Research Institute. (2015). *Global Nutrition Report 2015: Actions and Accountability to Advance Nutrition and Sustainable Development*, Washington: IFPRI.
- [4] Banerji, R., Bhattacharjea, S., Wadhwa, W. (2013). *The Annual Status of Education Report*. New Delhi: Research in Comparative and International Education.
- [5] Results for Development (2015). *Bringing Learning to Light: The Role of Citizen-led Assessments in Shifting the Education Agenda*, Washington: Results for Development Institute.
- [6] PAL Network. “Where we work”. Retrieved on 15/05/2018 from <http://palnetwork.org/where-we-work/>
- [7] ASER Centre. (2016). *Annual Status of Education Report (Rural), 2016*, Delhi: ASER Centre.
- [8] ASER Centre, ‘Sample Design of Rural ASER. Retrieved on 01/05/2018 from “http://img.asercentre.org/docs/Asere%20survey/Sampling/Sample_Design_of_Rural_ASER_1.pdf”
- [9] Water and Sanitation Program. (2015). *Management of Child Feces: Current Disposal Practice*, Washington: International Bank for Reconstruction and Development, The World Bank and UNICEF.
- [10] Guidelines for Enhancing Optimal Infant and Young Child Feeding practices (2013). *Ministry of Health and Family Welfare, Government of India*.
- [11] Integrated Child Development Scheme. Retrieved on 12.09.2018 from <https://icds-wcd.nic.in/icds.aspx>
- [12] Bill and Melinda Gates Foundation. <https://www.gatesfoundation.org/>
- [13] National Institute of Nutrition, ‘Dietary Guidelines for Indians: A Manual’. (2011) Retrieved on 27/12/2018 from <http://ninindia.org/DietaryGuidelinesforNINwebsite.pdf>
- [14] Water and Sanitation Program. (2015). *Management of Child Feces: Current Disposal Practice*, Washington: International Bank for Reconstruction and Development, The World Bank and UNICEF.