Introduction

Child malnutrition remains a challenge in Indonesia, as further explained in Global Nutrition Report 2014 and 2015. The use of mobile phone technology may offer innovative opportunities to tackle child malnutrition more effectively. Despite the global enthusiasm for using mobile phones for nutrition service delivery, there are only very few studies that critically assessed their application. World Vision together with the Institute of Development Studies (IDS), UK evaluated the piloting of a mobile phone application for nutrition service delivery in Indonesia. The mobile phone application was thereby integrated into the existing national nutrition service delivery through the posyandu programme over a period of 12 months (December 2014–December 2015) in both urban and rural sites in Indonesia. This event aims to share the findings of the evaluation and to discuss the potential implications of the use of mobile phone technology on the effectiveness of posyandus in preventing child malnutrition.

Evaluation approach & objectives

This evaluation used a multisite case study approach and combined a quantitative counterfactual design based on Mill’s Method of Difference, realist evaluation and qualitative in-depth analysis. The objectives were:

1. To assess the impact of the mobile phone application on data accuracy of growth monitoring.
2. To assess the impact of the mobile phone application on timeliness of growth monitoring.
3. To explore the impact of the mobile phone application on real-time responsiveness to the growth monitoring data.
4. To assess the impact of the mobile phone application on the quality of nutrition counselling as a part of the posyandu’s programme.

Findings

- **Improved data accuracy**
  The mobile phone application significantly improved the accuracy of nutrition status classifications in the posyandus. Without the mobile phone and based on traditional paper-based plotting around 1 in 3 children were misclassified (Misclassification rate ranges from 16% to 63%). Mainly children who were mildly underweight were incorrectly categorised as normal weight and thus missed for early detection of undernutrition. The mobile phone application improved the accuracy of nutritional status classification by on average 80% (95%CI (75.9–83.1), P=0.005). Improvement in accuracy were greatest in the rural posyandus in Sikka (94%), followed by North Jakarta (64%) and East Jakarta (31%). Despite these improvements, issues around trust in mobile phone based classifications emerged as a barrier to use at community-level in some posyandus.

- **More timely data submission**
  The mobile phone application significantly improved the timeliness of data submission from the posyandu to the sub-district health office. Median time lag differences between the paper- and mobile phone-based systems ranged between 1.5 hours to more than 10 days. The improvement in timeliness was especially pronounced in urban posyandus in Jakarta. Context-specific barriers to more timely data submission by mobile phone were found.

- **Improved responsiveness of cadres to the data**
  The mobile phone application significantly increased cadres’ responsiveness to the growth monitoring data as assessed by the propensity of providing feedback to caregivers on the nutrition status of their child/Ren. There were some context-specific differences with the impact of the mobile phone on the likelihood of feedback provision being strongest in Sikka and North Jakarta but not East Jakarta.

- **Better nutrition counselling**
  Analysis on the evaluation findings on the effectiveness of the mobile phone application on quality of counselling are ongoing. Preliminary findings suggest that both cadres and caregivers perceived an improvement in the quality of counselling with the mobile phone. But there were also some context-specific barriers.

Conclusion

Overall the mobile phone application improved the quality of growth monitoring data and counselling in the selected posyandus, although there were huge context-specific differences in the impact.
Impact Evaluation of a Mobile Phone Application on Nutrition Service Delivery

In Indonesia

- 19.6% Underweight
- 37.2% Stunting

**Posyandu** is a community-based monitoring system that monitors maternal child health and nutrition in Indonesia. Existed since 1986, and there are 289,635 Posyandu in Indonesia now (2016).

Challenge in Posyandu
lack of cadre's capacity
timeliness of the report
accuracy of the data
limited counselling

Indonesia has become the country which has a large internet user (88.1 million people and 43.2% internet penetration).

Smartphone user in Indonesia reach 74.9 million people with 43% penetration rate.

source: we are social. 2016

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**Wahana Visi Indonesia was piloting smartphone application for Posyandu**

**Partner in Pilot Project**

- **unicef**
- World Vision
- *dimagi*

mPosyandu is an Android-based application for Posyandu which has 2 features; growth monitoring and community-based nutrition counselling using IYCF module.

All the data in mPosyandu will be stored in cloud server and can be used to make a decision any time.

**mPosyandu Piloting**

This application has been piloting for 30 months in 2 areas and 14 Posyandu, 10 Posyandu in Sikka, for rural area and 4 Posyandu in Jakarta for urban area. 74 Community Health Volunteer were take part to this implementation.

The evaluation was done by Institute of Development Studies (IDS) funded by UKAID and used mix method both qualitative and quantitative for 12 months (January 2015–January 2016).  

*multi-site case study design, Mill’s Method of difference as underlying causal inference design, realist approach, process tracing*
Evaluation Result

- **80%** increase data accuracy in average (95% CI (75.9-83.1), \( p = 0.005 \))
- **52 hr** report more timely in average (95% CI (24.2-79.4), \( p = 0.005 \))
- Significantly increase propensity of giving feedback (\( p = 0.005 \))
- Perceive as increase counselling quality

Literature study mentioned that growth monitoring could be effective if only giving feedback and counselling process are work properly.

"mPosyandu application is very helpful, the report can be obtained any time, it helps the cadres. We feel the ease through using of mPosyandu compared through the old process that usually (without application-red) takes a long time, the report also takes a long time ..."  
Karolus M, Head of Primary Health Center, Nita, Sikka

"Now there is a new service in Posyandu, its name is mPosyandu, I just need to touch it (the smartphone-red), easy to follow the steps, all the data is complete here, not afraid the data will missing."  
Nunung, Cadre of Posyandu Matahari 1, Jakarta

"Sometime, policy-making related to nutrition status is late because the data is late to be known, through this Program it can be known at any time."  
Heny Kerong, Transition Manager, AIPMHNH

"When I went to Posyandu this morning, the cadres there told me that my son was in the yellow or malnourished category, they were scheduled to make a home visit, it turned out that today she really came in. The Posyandu service is better now, they gave a lot of information. Before I just know eggs as a source of nutrition, now I know there are many other sources. There are many pictures in the application, so I can more understand about the nutrition for children than before. "  
Hana Noviana, Mother

Research Conclusion

mPosyandu improve quality service of Posyandu by improve data accuracy, timeliness of the report, increase counselling quality, and increase tendency of giving feedback.

Scan this code to get mPosyandu application or check this link to watch the video bit.ly/mNutrition

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