PROMISING PRACTICES IN
HEALTH CAMPAIGN MICROPLANNING

A summary of microplanning issues and opportunities for global organizations and country-level stakeholders who plan or oversee health campaigns

Purpose

To provide a summary of key microplanning issues and suggest opportunities for additional exploration

Target Audience(s)

- Global organizations that fund, oversee, coordinate, or issue guidance around health campaigns
- Regional and country-level stakeholders who oversee, plan, implement, or monitor health campaigns

Contributors and Date Submitted

Camber Collective, Task Force for Global Health | July 2020
Contact information: campaigneffectiveness@taskforce.org

Key Messages

- Microplanning is an important feature of health campaign planning and can guide more effective operational planning and implementation

- Microplanning is used across many different health campaigns, but challenges exist; these can prevent microplans from being developed and used in a consistent manner based on shared best practices

- Many programs have developed and deployed novel microplanning approaches that potentially could be considered best practices; these should be explored for broader use

- Additional research is required to determine the adaptability of an approach to other programs; new forums or mechanisms are needed to promote sharing and discussion of approaches that have been deemed best practices

Introduction

Microplanning is the process of creating detailed, delivery-level operational plans for reaching target populations with health interventions. Recognized as a critical component of effective and efficient health campaigns and often defined at multiple levels, microplanning can include both regional- and state-level operational planning as well as granular implementation plans at the district and local levels (1). While microplanning can significantly improve campaign performance, many organizations, governments, and programs are not positioned to undertake effective microplanning because of lack of resources, poor quality data for population targeting and progress tracking, and knowledge gaps around efficient microplanning practices (2). Despite these challenges, some programs have successfully developed and deployed innovative microplanning approaches that may be adaptable to other programs and geographies.

Promising microplanning approaches are more relevant than ever as organizations and governments mobilize to address the COVID-19 pandemic. Individual programs now face common challenges in determining how to design and implement campaigns that adhere to guidance around social distancing and safe intervention delivery while also compensating for planned campaigns that were cancelled or postponed. The global health community now faces a crucial moment to consider how to optimize microplanning approaches to efficiently reach the greatest number of at-risk populations.

Methods

This report is based on a review of publicly available microplanning resources that were either shared directly or collected through a brief online search of public databases (e.g., PubMed) and include specific microplanning guidelines as well as peer-reviewed papers. Also included are key takeaways from a 2-day meeting entitled "Microplanning for Improved MDA and Campaign Results," which was convened in London in February 2020 by the Bill & Melinda Gates Foundation and attended by 40 stakeholders who represented a wide range of health campaigns and geographies and shared their learnings around promising and innovative microplanning approaches.

Summary of Findings

Microplanning approaches and innovations often focus on individual diseases, with proportionally more research on vaccine-preventable diseases such as measles and polio that have well-established and well-resourced programs in many countries (2,3). Overall, both the discussion at the 2020 Microplanning Meeting and findings from the literature review suggest that microplanning can be a valuable strategy for improving campaign effectiveness.

This report outlines **four key areas** where promising practices may exist for further exploration as means of improving microplanning across different campaign programs:
1. *Cross-campaign sharing and synergies*
2. *Data quality and access*
3. *Community engagement*
4. *Efficient planning, implementation, and management*

We begin each section with a brief discussion of the opportunity, then highlight **specific opportunities to improve microplanning** within each area and **provide examples** identified from the literature review and/or discussions that occurred during the 2020 Microplanning Meeting.

1. Cross-campaign sharing and synergies

The strongest message from the stakeholders in the 2020 Microplanning Meeting was that vertical programs and a lack of alignment at both the donor and country levels are significant burdens to effective microplanning. While some programs have incorporated guidelines and suggested best-practices around microplanning (4-6), other programs make insufficient use of microplanning to guide activities—resulting in missed populations, inefficiencies in program management, and other challenges (3,7) .

Fragmentation in global-level priorities and its impact on resourcing and funding decisions contribute to variability in the quality of in-country microplanning. This fragmentation is seen in inconsistent resourcing across campaign interventions. Additionally, the influence of donor resources can also result in donor priorities that define or supersede the priorities of country health plans. The 2020 Microplanning Meeting attendees agreed that while there are promising and best practices known within each campaign intervention, there is an opportunity to codify and share such practices to support their broader use.

Emerging area(s) in for future exploration to improve microplanning: *Adapting approaches from other programs and exploring opportunities for coordination*

Through presentation of case studies and other examples, attendees of the 2020 Microplanning Meeting discussed a wide range of microplanning approaches and assets that have been explored within different programs. There was also recognition that programs do not adequately share and adapt approaches and learnings from one program to another. Participants recognized that this is largely driven by incentives and fragmentation between different intervention programs but called for joint efforts on the part of donors, country governments, and other stakeholders to support cross-platform learning and sharing of successful approaches.

Reviewed literature in this area included the following examples:

- A vitamin A deficiency study in Mozambique found that low-quality microplanning or lack of microplanning resulted in challenges related to outreach to hard-to-reach children and poor supply chain management. By adapting the [Reaching Every District/Reaching Every Child](#) approach that has been proven in immunization, microplanning is now included in health worker training and used in all health outreach services in all supported health facilities in USAID's [Maternal and Child Survival Program](#) catchment areas (8).

- In Ethiopia, a rigorous microplanning approach was used for measles supplementary immunization activities (SIAs) in 2010-2011 and included integration with polio, deworming, and vitamin A supplementation activities (9). The approach was designed to incorporate best practices learned from other SIAs and countries that were deemed relevant for the local context. As part of this approach, microplans were developed with health extension workers and local administration via a standardized planning template, emphasizing hard-to-reach communities. The Central Statistics Authority was also engaged to ensure that planning and forecasting of target populations was accurate. At the end of the SIAs, over 8.9 million children received the measles vaccine (106% of target population), 12.8 million received the polio vaccine (97% of target population), 7.2 million

received vitamin A supplementation (97% of target population), and 5.1 million received deworming medication (102% of target population).

Discussion and implications: Many existing resources for microplanning are organized vertically by disease area. Developing common microplanning approaches for multiple interventions can increase efficiency through knowledge sharing, common data sources, and shared infrastructure. Additional research is required to collate additional examples of approaches used across multiple programs and to provide examples of how existing microplanning approaches can be modified or reframed to have functional relevance across health campaigns.

2. Data quality and access

Experts at the 2020 Microplanning Meeting cited poor data reliability and consistency as among the most common and acute challenges facing microplanning. High quality data is a critical input to the microplanning process; inaccurate or insufficient data can result in inaccurate microplans that overlook critical populations, lead to the misallocation of staff and supplies, or improperly calculate coverage statistics. Meeting participants discussed the underlying challenges in demographic data accuracy related to unreliable or outdated national census data. These concerns are further complicated by global-level actors and implementers who often create their own datasets to overcome concerns about country-generated data.

Meeting participants also discussed a shared vision for gold-standard, single-source datasets that could be available at multiple geographic levels and across campaigns. The literature suggests that an early opportunity to drive progress in this area is continued exploration of methods to improve accuracy of input and reported data from interventions, such as application of geographic information systems (GIS) for population estimation and validation. Practices which improve datasets can help microplans more effectively identify and serve key populations.

Emerging area(s) in for future exploration to improve microplanning: *A) GIS and mapping and B) MOUs and data-sharing agreements*

A) GIS and mapping
Geographic information systems can be used to improve the quality of microplanning and the overall reach of health campaigns by more accurately estimating and locating underserved populations that might otherwise be missed by campaigns (5). The 2020 Microplanning Meeting participants discussed numerous examples of the utility of GIS, citing projects such as such as GRID3 surveillance, Bluesquare's human African trypanosomiasis elimination data management technology, Maxar's footprints and imagery to improve mapping resources, vaccine tracking systems to track vaccinators and delivery boundaries, and a Bill & Melinda Gates Foundation effort supporting the Niger government and key partners to identify and assess existing datasets and develop local capacity to improve enumeration data.

Reviewed literature in this area included the following examples:

- In Pakistan, community maps were updated to identify population sites and school locations, with a baseline survey also used to analyze inequalities in access and geographic distribution. For these efforts, GIS was used to identify and prioritize locations for the opening of schools by codifying and disseminating guidelines for community mapping through the use of spatial and non-spatial baseline data (10).

- In Nigeria, multiple efforts have demonstrated the potential of GIS as a means of creating more accurate maps that include settlements otherwise likely to be missed by vaccination teams relying on prior population data. Such efforts enhance the efficiency and effectiveness of health campaigns by improving allocation of teams and coverage of target groups. Technologies are still limited by the quality of available data and the capacity to use the technology, but GIS can improve the ability to triangulate across multiple data sources to improve microplanning inputs while allowing for near real-time monitoring of health team performance (11-13).

- In Uganda, the Reaching Every Community using Quality Improvement (REC-QI) approach used a participatory, two-stage process for mapping that takes into account both community locations and characteristics as well as the resources in place by health facilities for routine immunization. In the first stage, macro-mapping is used by the district to identify and assign communities at the parish level to health facilities to enable effective health service delivery. In the second stage, micro-mapping is used by the individual health facilities to identify and assign communities at the village level within the facility's catchment area to routine immunization service delivery points (14).

Discussion and implications: GIS is being used across many contexts to validate and improve the quality of baseline population data, which is among the most critical inputs to the microplanning process. Accurate community-level data can improve the quality of microplans, but additional work is needed to help campaign administrators understand the cost, staffing issues, and other operational implications of incorporating GIS into a campaign's planning process. Additionally, comparison of GIS methodologies could help establish a better understanding of the benefits and drawbacks of different approaches.

B) MOUs and data-sharing agreements
The 2020 Microplanning Meeting participants expressed interest in establishing data sharing agreements between countries and global-level data aggregators. Along with these agreements, there was a recognized need for data governance support to countries to encourage consistency in country ownership of datasets and use of those datasets for all programs. Participants voiced that country-level ownership of data is critical to ensure that countries themselves are developing sustainable data collection and management processes. At the same time, data sharing agreements can ensure that other organizations can access and use the data easily while being incentivized to help countries develop robust data management processes.

Discussion and implications: Transparency and access around data can help to ensure that microplanning efforts across campaigns are based on the same baseline information, which can increase confidence and consistency in coverage statistics and population targeting. Next steps to achieve this shift could include exploring how to improve incentives to share data across levels and developing case studies to highlight countries or programs that may already be demonstrating best practices in this area.

3. Community engagement
High-quality microplans should be developed in partnership with community health workers and community leaders to ensure relevance to and proper engagement with key populations. Microplanning efforts have led to improved organization of community-level workers, more comprehensive engagement of hard-to-reach populations within target communities, and improvements in compliance with mass drug administration (MDA) recommendations and

guidelines (15-17). However, experts at the 2020 Microplanning Meeting were clear that there are still many examples of microplanning processes that do not adequately include community members, noting that inadequate community engagement can lead to an incomplete understanding of how to engage high-risk populations. Community engagement was highlighted as the gateway to identifying and targeting zero-dose populations while also driving uptake and acceptance of interventions and increased accountability among community health workers.

Emerging area(s) in for future exploration to improve microplanning: *A) Bottom-up community engagement and B) Communications technology*

A) Bottom-up community engagement
Attendees at the 2020 Microplanning Meeting highlighted mobilization of community health workers as a critical component of effective microplanning, with some discussion of India's Accredited Social Health Activist (ASHA) system that incentivizes accountability and quality while increasing relevance and use of the intervention among community members.

Reviewed literature in this area included the following examples:

- In Bhutan, the Support to Rural Livelihoods and Climate Change Adaptation in the Himalaya (Himalica) initiative uses bottom-up microplanning as a core component of its strategy. The community-led microplanning begins at the grassroots level and seeks to influence higher level planning and to represent the grassroots population in the decision-making process. Closer connection to the community improves problem identification, prioritization, and analysis by bringing community members to the center of decision-making processes (18).

- In Indonesia, a micronarrative survey tool was developed and used to inform the microplanning process for MDA to eliminate lymphatic filariasis. Survey results indicated that specialized messages to promote compliance with MDA messages were needed to reach women and younger men. This information was used to inform and adapt the MDA microplan to tailor outreach for these populations. As a result, subsequent rounds of MDA achieved significant improvements in coverage and compliance (19).

Discussion and implications: While bottom-up engagement often involves a more time-intensive approach of identifying and engaging community members, using bottom-up approaches in microplans can help increase the acceptability and efficiency of campaigns by identifying and accounting for potential problems that may manifest in implementation. Further efforts should be made to explore the variations in bottom-up approaches and begin to understand and identify best practices across contexts.

B) Communications technology
The 2020 Microplanning Meeting attendees called for increased use of SMS messaging and push alerts to anticipate challenges or bottlenecks within a given community. These techniques can also be used to promote awareness and communication with target populations, which can lead to increased uptake of the intervention and a reduced number of refusals.

Reviewed literature included limited examples of communications technology for community engagement. In an example from Kenya, a mobile platform used for measles integrated both planning tools and communication functions to improve community outreach. The approach

resulted in improved coverage, increased awareness among targeted populations, and reductions in both refusals and missed house visits (20).

Discussion and implications: Communications technology has the potential to identify early indications of campaign acceptability within a given community. Research into additional examples of the use of communication technology is needed to further explore how this technology has improved the development of microplans.

4. Efficient planning, implementation, and management
Microplans offer a unique approach to account for contextual differences between countries, sub-national areas, and urban centers versus rural areas (21,22). Microplans are inherently labor intensive, and the literature suggests that opportunities to streamline delivery processes can increase efficiency of campaigns. At the same time, microplanning processes should be tailored to specific contexts to ensure that approaches are need-based and avoid missing at-risk populations (23,24).

Both the literature and discussion from the 2020 Microplanning Meeting highlight the importance of clear microplans that succinctly articulate roles, responsibilities, and expectations of teams. They emphasized supervision structures and appropriate training as areas that are sometimes overlooked in the microplanning process but which are key to driving accurate reporting and high intervention coverage.

Emerging area(s) in for future exploration to improve microplanning: *A) Comprehensive microplans and standardization, B) Supportive supervisory structures and workplan balancing, and C) Efficiency through mobile technology*

A) Comprehensive microplans and standardization
The 2020 Microplanning Meeting participants called for increased use of templates to help ensure that proven microplanning methods are standardized. In the reviewed literature, a study in Ethiopia examined a mass oral cholera vaccination campaign administered through the public health system. A rigorous bottom-up microplanning process guided selection of sites, cold chain, supplies, and personnel needs, including monitoring and supervision plans for training, social mobilization, communication, and adverse events following immunization. The program attributed its rigorous microplanning process with making the program affordable and acceptable to the community (25).

Discussion and implications: Where possible, opportunities should be explored to support the sharing of templates and examples of successful microplanning approaches that might be applicable across multiple programs. Additionally, existing microplanning guidelines from different disease areas should be cross referenced to identify common points of alignment and explore further opportunities for generalized or cross-campaign microplanning guidance and resources.

B) Supportive supervisory structures and workplan balancing
The 2020 Microplanning Meeting attendees recommended strong supervisory processes to support clear understanding of roles and responsibilities, as well as effective coordination and feedback practices that help to ensure that community health workers are not overburdened and have adequate support. Root-cause analysis was also suggested as a practice, along with proper data validation and independent monitoring, for understanding underlying causes of challenges in campaign implementation.

Reviewed literature in this area included the following examples:

- The Reaching Every District (RED) approach to microplanning uses a bottom-up approach to link services with communities being served. Barrier analysis and mapping approaches help to support data analysis and problem solving at the local level, and reorienting management approaches away from an "inspection," top-down mindset to more collaborative "supportive supervision" to improve collaboration and transparency among teams. Although this approach is specifically designed for use with immunization programs, there is some evidence that it has potential for wider health system and intervention applications (8,26).
- A microplanning effort in Kenya around HIV/STI services found that mapping and target-setting were improved through mapping and that estimation exercises and peer educator workloads were more effectively balanced. A standardized national approach supported by technical support and adequate staff resulted in more outreach contacts and higher levels of service uptake and utilization (27).

Discussions and implications: Microplans provide the operational guidelines for a campaign, and examples suggest that supervisory structures can be optimized within microplans to increase efficiency and effectiveness of teams. Additional research is required to explore characteristics of optimal supervision structures that can be included in microplans, including any indications of contextual differences in effective supervision strategies.

C) Efficiency through mobile technology
In addition to the function of improving community engagement mentioned earlier in this document, mobile technologies can significantly improve collection, aggregation, and sharing of critical information related to the planning and implementation of campaigns. The 2020 Microplanning Meeting attendees cited campaign monitoring as a key area where tools can improve efficiency and accuracy, resulting in more effective implementation of the microplan.

Reviewed literature in this area included the following examples:

- A measles rubella campaign replaced hard-copy forms used during the microplanning process with a mobile application. The change yielded high response rates (46/47 counties) for reports on the number of children to be targeted within the age range and on where the children could be found. Quality and timeliness of data transfer, integrity, tracking, visualization, reporting, and analysis were all improved as key inputs to microplanning processes. This change enabled real-time feedback to the national focal point and real-time troubleshooting by supervisor-level staff (28).

- A suite of mobile health tools using SMS messaging and mobile applications (the Liverpool mHealth Suite, or LMS) has been used in several settings including Malawi, Ghana, Ethiopia, Bangladesh, and Tanzania to support a broad range of functions, including real-time coverage tracking, reporting of patient counts, stock level management for supplies, and communication tools to inform care. These applications have shown positive impacts in several settings and are direct inputs to the microplanning process (29).

Discussions and implications: Mobile technologies can increase campaign efficiency by expediting communication and integrating disparate aspects of the microplanning process. Additional

research and synthesis around available platforms and critical functionalities of different platforms should be explored to determine characteristics that are most beneficial for microplanning.

Conclusions and Path Forward

As programs continue to seek efficiency gains and improved ability to target hard-to-reach populations, microplanning is seen as an effective strategy to improve performance. Across the literature and from experts who attended the 2020 Microplanning Meeting a breadth of promising practices have been highlighted for further exploration, also demonstrating a need for programs to look across the conventional vertical disease programs (polio, malaria, etc.) and explore innovative approaches from other domains.

Next steps related to exploring promising and best practices in microplanning should include the following:

- Additional research should be conducted to more comprehensively **document innovative use of technologies being employed for microplanning improvement**, such as GIS and mobile-based planning and communication platforms. This is important to support knowledge sharing around promising technologies across disease areas and contexts.
- Given the breadth of microplanning guidelines and practices developed for specific disease areas, there is valuable research to be done to **determine which practices might be applicable across multiple disease areas** versus those where different contexts and disease areas require unique approaches to microplan development
- Related to the preceding point, **organizations and institutions should find ways to share and discuss microplanning approaches across disease areas and contexts more intentionally**. This could include more regular development of case studies and examples of successful microplanning tactics. Cross-campaign sharing would also benefit from a common forum where these types of insights could be shared on an ongoing basis.

References

1. Global Polio Eradication Initiative. The Microplanning Puzzle: Planning for an Effective Vaccination Campaign. Aug 23, 2017 (http://polioeradication.org/news-post/the-microplanning-puzzle-planning-for-an-effective-vaccination-campaign/).
2. The Campaign Effectiveness Landscape and Case for Action (2020), developed by Camber Collective in partnership with the Bill & Melinda Gates Foundation and the Task Force for Global Health. https://taskforce.org/wp-content/uploads/2020/04/Campaign-Effectiveness-Landscape-and-Case-for-Action-February-2020-Public.pdf
3. USAID Neglected Tropical Diseases Program. Neglected Tropical Diseases Technical Consultation, May 9, 2017. (Executive Summary available at https://www.neglecteddiseases.gov/resources/newsroom/news-detail/neglected-tropical-diseases-technical-consultation-executive-summary.
4. The International Coalition for Trachoma Control (ICTC). Micro-planning for effective Zithromax® Mass Drug Administration, Dec 2015. (https://www.trachomacoalition.org/sites/default/files/content/resources/files/ICTC%20MDA MicroPlanningGuide%20042016%20v5.pdf)

5. Global Polio Eradication Initiative. Best practices in microplanning for polio eradication. (https://www.who.int/polio-transition/documents-resources/best-practices-microplanning.pdf?ua=1)

6. WHO. Planning and implementing high-quality supplementary immunization activities for injectable vaccines using an example of measles and rubella vaccines: field guide. World Health Organization, 2016. (https://www.who.int/immunization/diseases/measles/SIA-Field-Guide.pdf?ua=1)

7. Picolo M, Barros I, Joyeux M, et al. Rethinking integrated nutrition-health strategies to address micronutrient deficiencies in children under five in Mozambique. Matern Child Nutr 2019;15(Suppl 1):e12721. doi: 10.1111/mcn.12721

8. WHO. Microplanning for immunization service delivery using the Reaching Every District (RED) strategy. A WHO-UNICEF document. WHO, 2009. (https://www.who.int/immunization/sage/9_Final_RED_280909.pdf?ua=1).

9. Ethiopia Federal Ministry of Health. Implementing best practice measles SIAs: the Ethiopia experience. May 2011. (https://www.unicef.org/evaldatabase/files/2011_Esaro_Regional_-_SIA_evaluation_report.pdf).

10. Shah T, Bell S, Elahi M. School mapping in education micro-planning: a case study of Union Council Chak 84/15L, District Khanewal, Pakistan. Prairie Perspectives: Geographical Essays 2011;14. (http://pcag.uwinnipeg.ca/Prairie-Perspectives/PP-Vol14/Shah-Bell-Elahi.pdf).

11. Dougherty L, Abdulkarim M, Mikailu F, et al. From paper maps to digital maps: enhancing routine immunisation microplanning in Northern Nigeria. BMJ Global Health 2019;4:e001606.

12. Barau I, Zubairu M, Mwanza MN, Seaman VY. Improving polio vaccination coverage in Nigeria through the use of geographic information system technology. J Infect Dis 2014;210:S102-S110.

13. Gammino VM, Nuhu A, Chenoweth P, et al. Using geographic information systems to track polio Vaccination team performance: pilot project report. J Infect Dis 2014;210:S98-101.

14. USAID Maternal and Child Survival Program. Reaching every community using quality improvement (REC-QI): mapping to support routine immunization microplanning in Uganda. August 2016. (https://www.mcsprogram.org/wp-content/uploads/2016/08/MCSP-Uganda-REC-QI-Mapping-Process.pdf)

15. Reza-Paul S. Steen R, Maiya R, et al. Sex worker community-led interventions interrupt sexually transmitted infection/human immunodeficiency virus transmission and improve human immunodeficiency virus cascade outcomes: a program review from South India. Sex Transm Dis 2019;46(8):556-562.

16. Nandha B, Krishnamoorthy K, Jambulingam P. Towards elimination of lymphatic filariasis: social mobilization issues and challenges in mass drug administration with anti-filarial drugs in Tamil Nadu, South India. Health Educ Res 2013;28(4):591-598.

17. Corley AG, Thornton CP, Glass NE. The role of nurses and community health workers in confronting neglected tropical diseases in sub-Saharan Africa: a systematic review. PLoS Negl Trop Dis 2016;10(9):e0004914.

18. Gurung MB, Samdrup T, Bhuchar S, Syangden B. Community-led micro-planning: building capacity of local leaders for participatory planning in Bhutan, 8-10 February 2017, Tsirang Dzongkhag, Bhutan. ICIMOD, 2017. (https://lib.icimod.org/record/32685?ln=en)

19. Krentel A, Damayanti R, Titaley CR, Suharno N, Bradley M, Lynam T. Improving coverage and compliance in mass drug administration for the elimination of LF in two 'Endgame' districts in Indonesia using micronarrative surveys. PLoS Negl Trop Dis 2016;10(11):e0005027.

20. Mbabazi WB, Collins WT, Chemirmir C, et al. Innovations in communication technologies for measles supplemental immunization activities: lessons from Kenya measles vaccination campaign, November 2012. Health Policy Plan 2015;30(5):638-44.

21. Adams AM, Vuckovic M, Birch E, et al. Eliminating neglected tropical diseases in urban areas: a review of challenges, strategies and research directions for successful mass drug administration. Trop Med Infect Dis 2018;3(4):122.

22. Wallace AS, Bohara R, Stewart S, et al. Impact of an intervention to use a measles, rubella, and polio mass vaccination campaign to strengthen routine immunization services in Nepal. J Infect Dis 2017;216:S280-S286.

23. Gali E, Mkanda P, Banda R, et al. Revised household-based microplanning in polio supplemental immunization activities in Kano State, Nigeria. 2013-2014. J Infect Dis 2016;213(Suppl 3):S73-S78

24. Seoung SC, Grundy BMJ, Ly CK, et al. Improving immunization coverage through budgeted microplans and sub-national performance agreements: early experience from Cambodia. Asia-Pac J Public Healt. 2006;18(1):29-38.

25. Teshome S, Desai S, Kim JH, Belay D, Mogasalec V. Feasibility and costs of a targeted cholera vaccination campaign in Ethiopia. Hum Vaccin Immother 2018;14(10):2427-2433.

26. Enkhtuya B, Badamusuren T, Dondog N, et al. Reaching every district—development and testing of a health micro-planning strategy for reaching difficult to reach populations in Mongolia. Rural Remote Health. 2009 Apr-Jun;9(2):1045.

27. Bhattacharjee P, Musyoki H, Prakash R, et al. Micro-planning at scale with key populations in Kenya: optimising peer educator ratios for programme outreach and HIV/STI service utilization. PloS One 2018;13(11):e0205056

28. Ismail A, Collins T, Onuekwusi I, et al. Micro-planning in a wide age range measles rubella (MR) campaign using mobile phone app, a case of Kenya, 2016. Pan Afr Med J 2017;27(Suppl 3):16.

29. Stanton M, Molineux A, Mackenzie C, Kelly-Hope L, et al. Mobile technology for empowering health workers in underserved communities: new approaches to facilitate the elimination of neglected tropical diseases. JMIR Public Health Surveill 2016;2(1):e2.