

## **Case studies**

### **Capacity Building on Scale:**

### **Scaling Up Programmes in different contexts:**

#### **Case Study- 1 Uttarakhand**

##### **Uttarakhand – scaling and uneven infrastructure**

Uttarakhand is a state in Northern India, which has various districts nesting in the foothills of the Himalayas, making access - both physically and electronically - a challenge.

1. The state started to implement their state HMIS, in December 2008, initially based on a district model. This implied that each district would get their different facilities to submit on paper their monthly reports, to the district HMIS officer, who was then responsible for manually aggregating the report for the district, and then entering it into the customized applications, which was deployed over the state server. The district aggregated report was then uploaded into the national web-portal. – Components of capacity building: ,
  - a. Skill building in competency 5 and 6 for District HMIS operators and in 1 for service providers.
  - b. Computers in district and state offices with internet connectivity.
  - c. DHIS 2 applications at the district and state levels- customisation for districts.
  - d. Handholding by facilitator after training to ensure data aggregation and uploading was learnt and followed:
2. After about six months as the district based process of reporting was stabilized, the state took the next step of scaling, by getting sub-district (called Block) based data. The list of all the blocks by districts was provided and these details were included in the organization unit hierarchy in the database. Now, we had all the districts and within each, all the blocks were included. In the next step, each block now made a block consolidated report for the month (including all the data from the Primary Health Centres and Sub-Centres in the block) on paper and sent it to the district office, where data was now entered electronically at the district level, but by blocks. The district consolidated report was generated electronically by the DHIS2, and this way the state and district managers could drill down to the blocks, to identify performance issues.
  - a. Skill Building on competency 1 for service providers and 3 for Data managers
  - b. Deployed computers at the block level
  - c. Establish the process of data validation and verification
  - d. Establish official HMIS team at state and District level
  - e. Handholding is provided by facilitating the state with HMIS fellow

3. Once this process was stabilized, the state took the bold decision to now scale the systems one step further: by now getting data disaggregated by particular facilities in the block. For this, it was important to do the data entry at the block itself, otherwise the load of data entry at the district, would be huge. However, while computers were available in the block level, internet connectivity was not enabling online data entry at the block level. To deal with this, offline installations of DHIS2 were made for each of the 88 blocks in the state, which had the particular hierarchies (PHCs and SCs) pre-configured in the installers for each block. These installers were then installed in the respective block computers, training was provided to the staff on how to enter data by their respective facilities and export the monthly data into a file, which would either be saved on a USB stick and sent physically to the corresponding district, or, by email using a dial-up connection. At the district office, this data would be imported into the online application, which would then be hosted on the server.
  - a. Skill building in competency 5 and 6 for Block HMIS operators
  - b. Establish strict time guidelines for data reporting
  - c. Initiated backward flow of issues addressed in the data ( State to Districts)
4. The possibility to drill down to the facility level helps to set in place various other processes, such as examining of data quality by facilities, establishing and strengthening of feedback and supervisory processes, and also allowing for the analysis of health status indicators by the facilities. This requires the maturing of user capabilities, and simultaneously, the scaling of the processes of capacity building – both in terms of the geographical coverage and the content of training.
  - a. Established process of data triangulation – Compare the data of HMIS – MCH report – 42 Point report
  - b. Use of information for planning ( in PIPs)
5. And as the state develops confidence in their HMIS related processes, they may consider including additional datasets in the application that would cater to the state reporting requirements in the future, in addition to the existing national reporting data sets currently included in the HMIS.

*In this way, the challenge of very uneven ICT infrastructure, even within the same district and block, could be addressed using a mix of varying technological solutions, and synchronizing it with different institutional practices and skill development to match these revised technical configurations.*

## **Challenges**

1. People resistance in moving towards the electronic system from paper based system
2. IT infrastructure resource non – availability ( like computers and internet connectivity)
3. Installing and using offline system in 95 blocks magnifies the technical issues and require continuous troubleshooting
4. Monitoring the performance of HMIS team as per the roles and responsibilities assigned.
5. Properly viewing the data at the time of verification at each level.
6. The database had to be scaled to be able to handle data from 1765 Sub-centres (consolidated), 246 Primary Health Centres, 51 Community Health Centers, 18 District and sub district hospitals, and also private institutions.
7. Server performance had to be constantly monitored and fine tuned to ensure it could handle the load of simultaneous users entering data in the last week of the month.
8. Capacity building programmes had to be carried out for more than 500 staff to ensure data entry and data quality management was done by the data collectors/compilers ie the health staff themselves.

## **Case Study – 2 : Scaling up of M-Health application in Punjab**

### **Scaling using mobile telephones in Punjab**

The first effort towards the use of mobile phones for supporting of reporting from the peripheral facilities was initiated in 2008, when the NRHM started a pilot in 5 blocks of 5 states in India covering a total of about 200 field nurses. HISP India developed the application for this based on GSM technology through which the report would be send via SMS to the DHIS 2 application (used as the HMIS data warehouse application in the 5 pilot states). In the pilot, the plan was to send the same SMS to the applications installed at three levels of the Block (sub district), District and State. In addition to building the application on a free and open source model, HISP India provided the required capacity building and support to the health workers on whose phones the application was installed. In this pilot, focused on sub center reporting, the dataset included 77 data elements covering ANC, Child Immunization and Family Planning. The pilot was evaluated as a success, and Punjab was one of the states that decided to go for a state wide implementation, covering 5000 health workers who would be given mobile phones from the state, and also CUG connections.

- a. Mobile Phones are required to be given to service providers for data reporting
- b. Application installation in mobiles and mapping the phone numbers with the individual ANMs is a tedious task.
- c. Skill building of service providers for using mobile's reporting

This initiative was a scaling challenge on various dimensions including functionality, geography and user support. With respect to functionality, while the initial application covered only 77 data elements, the State wanted to extend that to also include the reporting of mortality and morbidity details and other financial reports along with the basic sub center report. This extended the data elements list to about 150, and these then needed to be split into 2 datasets as one was too long to be sent in a single SMS and resulted in memory errors. Further, the state also wanted to use the phone to carry out health services monitoring on a daily basis, and 10 data elements were identified in this data set which mainly covered activities of a health worker on daily basis. From one data set of 77 data elements, in this case the application was scaled to 160 data elements, which were then divided into 3 data sets – two monthly and one daily.

- a. Customization of formats and guidelines designed for the finalized reporting formats - Training manual for the users (ANMs and district people) was first prepared, approved by the state and then translated in Punjabi language. The manual contained all necessary information like advantages of the application, guidelines by the state, information flow, tariff plan and various screenshots of mobile application to use it on the phone.
- b. Mobile Phones are required to be given to service providers for data reporting( 5000 mobile phones)
- c. Server management – Huge memory required

In terms of geography, while in the pilot only the field nurses from one Block (or sub district facility) was covered in each of the 5 pilot sites (about 30 nurses each), the project now covered 5000 nurses from about 2500 sub centres covering the whole state (20 districts). To deal with this massive expansion in scale, a shift was made in the model of reporting. Now all SMSs were only to be sent to a central server where the state DHIS 2 application was hosted. This meant that the SMS would now also be sent to the Block and District databases, and users from this level would need to access the data from the state server. However, this raised challenges at the server end, especially in the use of the GSM modems for receiving the SMS and for also sending out the acknowledgements back to the users whose SMS had been received. There were extreme challenges in managing this SMS traffic, especially the daily report covering 5000 messages. To deal with this, first the number of modems were increased to 3, were 2 were used for receiving the messages and one was exclusively dedicated to acknowledgements. Further, a change was also made to the queuing algorithm, wherein messages were processed in a batch mode rather than sequentially.

- a. Skill building of 5000 ANMs on using mobile application for daily reporting
- b. Establishing the database was a complex task involving lots of manual work in DHIS2 application.

In terms of implementation support, HISP India had to enhance its team both in numbers and the mix of skills. While in the pilot phase, after the initial phase of training, the technical person would visit the sites maybe once in 3 months for support, and the rest of the time remote support was provided. However, in Punjab given the scale of operations a total team strength of 10 members was created to cover all the training, and following that a team of 5 were based permanently in the State for 9 months to provide continuous support. The team now needed to include a dedicated server technician who needed to be at hand to deal with the constant problems related to the server and modem. 2 of the 5 members were software developers who needed to be continuously engaged in making improvements to the existing application, but also create new enhancements as the demands of the state grew with time. For example, the state demanded a feature of Mass SMS to health workers in order to obtain feedback from health workers regarding any service, programme, stock requirement or grievance report. For e.g. the state wanted to be able to send a SMS to all 5000 health workers to get a confirmation whether or not their monthly stock of IFA tablets had been received. This facility of enabling 2 way communication scaled the use of the phone from not just reporting but to also coordination and communication.

- a. Handholding by facilitator after training to troubleshoot the technical as well as system issues.

The scaling of the Punjab state mobile project makes it by far the largest implementation in the health sector in the world. It is interesting to also point out to how other states are in process of further pushing the boundaries of scaling. For example, the states of Himachal Pradesh and Nagaland want to scale the mobile based reporting for disease surveillance and control programme covering diseases like Polio, Malaria, HIV/AIDS, TB and other chronic diseases.

Various other states are planning to use the phone not only for number based reporting but also for reporting on names for tracking of pregnant woman care and child immunization in order to provide timely care and monitoring. Further, while till now the application had only been used for reporting from Sub Centres, the state of Nagaland also wants to use it for reporting from PHCs and CHCs where the data sets are much larger (about 200 data elements). This they plan to do because of the extremely poor internet connectivity, bad power situation, and also the difficult geography which makes travel complex.

## **Challenges**

1. There were extreme challenges in managing SMS traffic, especially the daily report covering 5000 messages.
2. Training of 5000 ANMs :
  - a) ANMs face a lot of problem in understanding the option of editing the report, clearing/deleting the figure, going back option and some of the elderly ANMs found it difficult to understand the functions and features of the application. Some ANMs who are on the verge of retirement were not ready to learn willingly.
  - b) Some of the ANMs have already deleted the application before the training session and some of them deleted during the training session.
3. Universally, the ANMs are not satisfied with Daily form and are not willing to report that.
4. In daily format whatever data elements are to be reported are the activities which are done on mainly on Wednesdays in their EPI sessions by the ANM. For instance, immunization is primarily done on Wednesday in Punjab; therefore the data element related to immunization in daily format will be filled as zero for most of the days of the week. Similarly, since the deliveries are not conducted at the Sub centres, so the data element related to the deliveries in the daily format will be mostly filled as zero. So by sending zeroes they think that they would be questioned and their performance will be affected.

## Annexure I

### Methods of Participatory Training

Methods	Key points	Strengths and weaknesses	When to use
<b>Lectures</b>	Lectures convey information systematically and give a good overview of the topic. Good lecturers know to modulate their voice, keep good eye contact with their audience, intersperse lectures with interactive questions and dialogue, and use humour effectively. Repetition is used to emphasize key points rather than to overload lecture with information. Distribution of handouts, copies of presentations before the lecture is useful.	Good for communicating facts. Low retention of knowledge disseminated. Use other methods to reinforce key points.	To conveying facts. With large groups. In absence of computers/projectors to make presentations.
<b>Presentations</b>	Power point presentations, charts, posters, or even writing on black board makes it easier to focus and recall. Needs good presenter and a good preparation. Eye contact with as many participants is possible. Interrupting flow of presentation for questions, jokes, visuals, etc. are helpful. Distribution of copies of presentations before the lecture is useful.	Good for presentation of many facts. Good for large groups. Impressive and inspiring. Difficult to replicate. Level of recall is poor.	To convey facts. When sub-themes are linked to a single framework. Large groups.
<b>Demonstrations</b>	Best for teaching hands-on skills. Facilitator demonstrates and all participants observe and repeat the demonstration using a check list. Demonstration models/computers/software required.	Good for hands-on training. Close to real situation. Requires a lot of equipments and preparation.	For skill learning (e.g., data entry, validation rules, report generation/uploading, use of dashboard etc.)
<b>Group</b>	A topic is given to group(s). Participants	Useful to follow or intersperse with	For issues that are

Methods	Key points	Strengths and weaknesses	When to use
<b>Discussions</b>	<p>voice their opinions. A good moderator gives everyone time and allows more time for those who have new insights to offer. Moderator sums-up and draws generalisations.</p>	<p>a presentation to make the presentation more participatory and interactive. Not everyone gets to speak if group is large. Needs a skilled moderator.</p>	<p>debatable (e.g., role of ASHA).</p>
<b>Small Group Discussions</b>	<p>Participants are divided in small groups (3-5 people). Set of tasks or questions is given to them for discussion. Group has to reach a consensus which is presented to the larger group/plenary. Moderator then facilitates discussion in large group.</p>	<p>Subject matter gets revised thrice (when it is read out, when questions are answered by each in the group, and when presented in the larger plenary). Those with low literacy skills/slow learners get fair opportunity to participate. Modest presentation skills are required. May take much more time if facilitator is not confident and dynamic.</p>	<p>When we are not in the experiential/group learning mode. When facts need to be internalised.</p>
<b>Case Simulation (oral/posters/videos)</b>	<p>Real life data are shown as a video clips, excel file, or presentation. These may be positive or negative deviance case. Group then comments and discusses the issues that arise from the case.</p>	<p>Helps discussion and resolution of problems encountered in field. Helps to question/resolve attitudes. Risk of getting carried away with theatrics.</p>	<p>For exploration of attitudes and perceptions when they act as a barrier.</p>



## Reference

1. MEASURE Evaluation, *Measuring Capacity Building in Health and Population Programs*; by Lisanne Brown, Anne LaFond, Kate Macintyre: Chapel Hill.
2. A Framework for Building Capacity to Improve Health, by NSW Health Department
3. MEASURE Evaluation , *A Guide to Monitoring and Evaluation of Capacity-Building Interventions in the Health Sector in Developing Countries*: **Anne LaFond, MS, JSI Research and Training**
4. International Journal of HEALTH MANAGEMENT AND PLANNING, *Mapping capacity in Health sector: Anne K LaFond<sup>1</sup>, Lissane Brown<sup>2</sup> and Kate Micentyre<sup>3</sup>*
5. *Introduction to capacity Building and Training*
6. DGOS – AIDS IMPULS PROGRAM 97203 BVO, *Health system capacity building: review of the literature*: **N. Boffin Institute of Tropical Medicine, Antwerp**
7. *Capacity assessment and development in a systems and strategic management context*. 1998. New York, United Nations Development Programme. Technical advisory paper 3.
8. Paul S 1995 Capacity building for Health Sector Reform. Forum on Health Sector Reform WHO Discussion Paper No.5.
9. Public Health Resource Network – Volume 5
10. Lippeveld T, Sauerborn R. *A framework for designing health information systems*. In: Lippeveld T, Sauerborn R, Bodart C, editors. Design and implementation of health information systems. Geneva: World Health Organization; 2000. p. 15-32.
11. Bodart C, Shrestha L. *Identifying information needs and indicators*. In: Lippeveld T, Sauerborn R, Bodart C, editors. Design and implementation of health information systems. Geneva: World Health Organization; 2000. p. 49-72.

12. Newbrander WC, Thomason JA, Kolehmainen-Aitken RL, Campos-Outcalt D, Afo G, Davidson W. Management support for provinces: a programme for developing provincial health management capabilities in Papua New Guinea. *International Journal of Health Planning and Management* 1988;3: 45-55.
13. *Information systems for health sector monitoring in Papua New Guinea*, by R.E. Cibulskis1 & G. Hiawalyer
14. *Resource Allocation for health equity: Issues and methods* by Finn Diderichsen
15. *Integrating Population, Health, and Environment* by Melissa Thaxton: Population reference bureau