Positive Public Health Management (PPHM)

Pilot in Meghalaya, India

A collaboration between the Smart Village Movement,
University of California Berkeley Haas Center for Growth Markets,
Government of Meghalaya, MayaMD.ai, and CHC Bhoirymbong

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EXECUTIVE SUMMARY

The northeastern Indian state of Meghalaya boasts a population of 3.5 million people living in more than 6,500 rural villages and is confronted with many of the problems faced by developing world. Notably, life expectancy is 62.3yrs, 6.5 years fewer than the average for India. In 2021, the state government published the Meghalaya Health Policy[1] to address key health challenges. This policy rests on a vision to shift the state's health paradigm from *disease management* to *disease prevention*, and ultimately improve livelihood. Positive Public Health Management (PPHM) is designed as the the vehicle for this shift, with resources to:

1. Screen entire village populations for key health indicators.
2. Conduct medical interventions where needed.
3. Educate villages in health-seeking behaviors
4. Sensitize and mobilize villages to participate in the program.

In January 2022, the Government launched a 6-month pilot of PPHM in the Bhoirymbong block of the Ri Bhoi district of Meghalaya to understand how it would be implemented and received by rural populations. The Pilot was conducted in partnership with the Smart Village Movement (program facilitators), MayaMD.ai (healthcare technology partner); KRSNAA Diagnostics (Lab diagnostics) and UC Berkeley (consultation & analysis). During this pilot, 2,087 people were screened across 45 villages.

The following four main findings emerged from this pilot:

A) Knowing and engaging key stakeholders were critical to establishing program credibility within the villages.

B) Simple tactics, such as using the village public announcement (PA) system to announce the screenings, were more effective at driving participation than more complex methods, such as a multi-day participatory mobilization.

C) Screening was often limited more by the team's capacity to handle demand during the morning and external factors, such as weather and internet reliability, must be considered in forecasting productivity

D) Increasing screening availability by holding more events in each village is necessary to increase participation.

These findings informed the design of PPHM for subsequent phases. Moreover, our study of the unique challenges and opportunities that come with government-driven changes has helped us create a practical strategy framework for managing inter-agency projects that we refer to as the **POWER Model** (Policy, Objectives, Work, Enablers, and Results)**.**

INTRODUCTION

Healthcare Opportunities in Meghalaya

People in Meghalaya now benefit from universal health insurance[2]. However, the current health infrastructure has limits in the quality and availability of preventative care.

There are three types of health facilities in rural Meghalaya. The **sub-centre** is the first contact point, serving about 3,000 people and staffed by two health workers. They can provide immunisations, treat symptoms of common communicable diseases, and advise on maternal and child health. For every six sub-centres (or approximately 20,000 people), there is one **Primary Health Center (PHC).** The PHC has at least one doctor (medical officer) and contains four to six beds. It is involved in both curative and preventative care. For every four PHCs, there is one **Community Health Center (CHC),** which is serviced by four medical specialists with capabilities to perform a variety of surgeries. Current infrastructure indicates that there is often only one doctor for every 20,000 people[3]. **Cost is also a major barrier to receiving healthcare services.** For example, mothers in Meghalaya have the highest average copay in India for a delivery - and this cost has increased 40% over the last four years to more than 14,000 Rs[4] .

The centralized nature of the health system can limit: 1) information disseminated to citizens and 2) knowledge about the state of health in rural villages by authorities in Shillong, the capital of Meghalaya. Larger health facilities are concentrated in urban areas and the mountainous geography of rural areas, combined with poor road conditions, stymie both accessiblity to facilities and communication of available services to the population. Moreover, the time and effort required to travel several kilometers to the PHC means that preventative health protocols (health checkups) are often not performed. Finally, there is still heavy reliance on manual health records.

Being intimately aware of these challenges, the Department of Health & Family Welfare, Government of Meghalaya, launched a new health initiative, MOTHER, in 2021[1]. (MOTHER - For achieving **M**easurable **O**utcomes in **T**ransforming **H**ealth sector through a holistic approach with focus on women's **E**mpowe**R**ment.) A key pillar of this initiative was mobilizing grassroots organizations, called self-help groups (SHGs) to empower communities to improve their collective health and act as a "last-mile delivery institution for participation" in healthcare[1].

Positive Public Health Management (PPHM)

The Mission of Positive Public Health Management (PPHM) is to increase health-seeking behavior, creating a paradigm shift from disease management to disease prevention and ensuring healthy living for the community.

We defined health-seeking behavior as a *"set of individual actions that are the manifestation of personal sentiments to health, or one's health-belief model. These include: adoption of tools (i.e. telehealth apps); interaction with the health system; and changes in key personal activities (i.e. hygiene, diet ,cooking, etc.)".*

Each village community is engaged through four basic mechanisms:

1 - Sensitization:
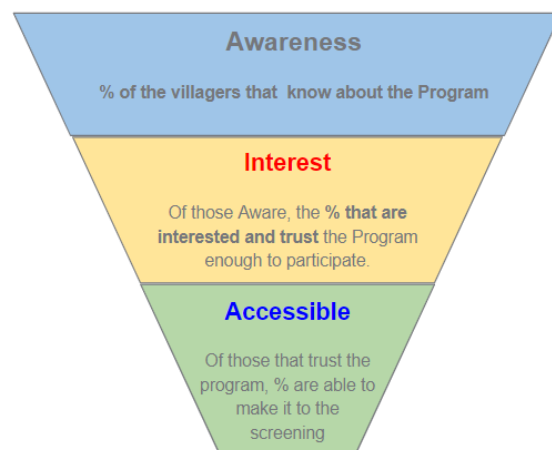
The population is informed about the screening and blood sample collection and involved in participatory public health discussions, such as mapping seasonal calendars of diseases or identifying local determinants of illness.

This interaction with the community is critical for driving awareness and interest in the program. Additionally, it can provide the logistics team with feedback on how to make the program more accessible (i.e. screening locations, hours of operation, etc.).

2 - Health Screening: Basic screening for age groups against 40 parameters determined to be locally relevant by a task force of doctors from the SVM, MayaMD, and the Department of Health & Family Welfare, the Government of Meghalaya, which provides concise information on the health situation (see the appendix, for the list of 40 parameters). Digital health records were created and maintained using the MayaPPHM application.

3 - Investigation: Blood sample diagnosis, based on age-appropriate panels. Maya Platform, MayaMD's cloud based core clinical intelligence and decision support system, provides backend algorithms analysis and sends data to health professionals for review and final diagnosis.

4 - Intervention: Timely check-ups are enabled by the MayaMD solution based on care pathways (see Figure 3 in Appendix) and telemedicine follow-ups enabled by the Meghalaya telehealth function. Working groups of health professionals leverage the Maya Platform to identify health trends and design interventions. SHGs are enlisted to support community interventions, and assist in education and timely reminders of PPHM activities.

PPHM is a seven-year journey with each community, allowing for comparative study and cross-sectional baseline research for pre-intervention and post-intervention evaluation.

For benchmarking, we looked at the Costa Rican model for public health[5]. Beginning in the 1990s, Costa Rica merged its public health and healthcare institutions and established a network of primary health care teams to provide annual health-screening visits to every household. The Costa Rican system is notable for its emphasis on the connection between public health and individual health, even while spending less than the world average on healthcare[5, pg. 25]. Since the national launch of its public health model, Costa Rica has seen a 94% drop in communicable diseases and its average life expectancy has surpassed the United States.

PPHM is similar to the Costa Rican model in emphasizing interdependence and economic outcomes, while leveraging AI technology and the nuances of local healthcare systems and communities to scale.

The PPHM Pilot & Impact Study

The first pilot of PPHM was designed to implement universal health screening within a single block, creating a baseline of health information for that population. Moreover, as health screening is a form of health-seeking behavior, this pilot is also helping the team understand the current demand of health-seeking behavior in the rural population of Meghalaya.

This pilot leveraged **Smart Village Movement's (SVM) triple-helix process** of innovation: merging the resources of government, universities, and corporations. Meghalaya's **Department of Health & Family Welfare** funded the research, enlisting the support of nodal officers and providing the support of local health resources. **University of California, Berkeley,** provided support and consultation in the research design. **MayaMD** provided a dedicated application (MayaPPHM) prioritizing the highest standards of data privacy and security concerns, which leverages artificial intelligence to enable the healthcare system to identify causative factors, patterns, and correlations.

METHOD & MATERIALS

Study Area and Population

Villages falling under the Bhoirymbong CHC in the Bhoirymbong Block, Ri Bhoi district were chosen for this study. The CHC caters to about 63 rural villages with 39,000 people in 6,000 households. There are approximately six to seven people per household. Ri Bhoi is an aspirational district and most of the villages in this study are a one to three hour drive from Shillong, the state capital of Meghalaya and the headquarters for the SVM ground team.

Field Team

The field team that entered each village consisted of project coordinators from the SVM, two field nurses from the community health center, and two lab technicians.

Those supporting this team include: 1) KRSNAA Diagnostics Private Ltd. to perform the lab diagnostics of the blood samples; 2) Faculty and graduate students from Martin Luther Christian University (MLCU) to conduct the Health PRA sensitisation; 3) Village Accredited Social Health Activist (ASHA) and Anganwadi workers to support sensitisation efforts; 4) e-Sanjeevani and Community Health Center (CHC) doctors to review patient results and recommendations from the MayaMD solution; and 5) Mid-Level Health Practitioners (MLHPs) to mediate teleconsultations on the e-Sanjeevani platform.

Technology

The MayaMD solution, MayaPPHM application along with the Maya Platform, was used to collect and analyze screening results (see appendix for AI-enabled capabilities of the MayaMD solution). The software Tableau was used to analyze and visualize the participation data of screening.

PPHM Field Activities

A screening event for each village followed the eight-step process, which started with driving awareness and ended with participants being referred to health centers for further consultations, as needed.

Step 1: Health Participatory Risk Assessment (PRA) with key village representatives and household heads

Step 2: Follow-ups with announcements for screening dates and finalization

Step 3: Screening Day, the first half, a community nurse screens each participant with the MayaPPHM application and their blood sample is collected by lab technicians. The second half, Lab Tech (LT) handover samples before 4 pm at CHC for KRSNAA pickup.

Step 4: Blood samples analyzed by KRSNAA and test results uploaded to Maya Platform. The Maya Platform automatically evaluates screening history and blood test results, and generates healthcare inferences, and creates a health profile and prognosis report (MayaPPHM report) for each participant. The MayaPPHM report of each participant is available online for review by a Meghalaya doctor, who edits the prognosis as needed, adds their care guidance and prescription as needed.

Step 5: PPHM ground team share the MayaPPHM reports with MLHP. .

Step 6: For those participants that need medical consultation as per their MayaPPHM reports, they are contacted and informed of the Meghalaya doctor's recommended care actions. SVM community nurse calls participants and summarizes the doctor's recommendations.

Step 7: ASHA workers deliver to each participant a printed copy of their MayaPPHM report.

Step 8: Participants visit a community health center for further consultation.

Data Collection

Data was collected from the MayaMD health screening and integrated with the village population data from the 2021 Community Needs Assessment to measure participation in PPHM.

In addition, qualitative data was collected through interviews with villagers to gain an understanding of key problems and create/implement countermeasures to scale learning.

RESULTS | Screening Participation

We want to emphasize that the most important results are not the progression of PPHM as a capability, but the lives in which we have already made a difference. Thus, while this paper addresses the capability of PPHM, future papers will analyze the health results and provide recommendations for a community health action plan.

From January 19th 2022 to June 30th, 2022, 2,087 people were screened from 45 villages. The percentages below are based on the total population for the pilot project area.

While 50% of the population, women are twice as likely to get screened as men. And while adults (19yrs or older) are 56% of the population, they are nearly twice as likely to be screened than children (figure 2).

Fig 1: PPHM Screening Response (30/06/2022)

Villages	45
People screened	2,087
Tot Pop % screened	6.7%
Families Screened	1,182
Households screened %	21.7%
Female % Screened	9.4%
Male % Screened	4.7%
Adults % screened	8.8%
Children % screened	4.9%
Children < 5 % screened	1.5%

Fig2: Screening by Gender and Adult vs Child
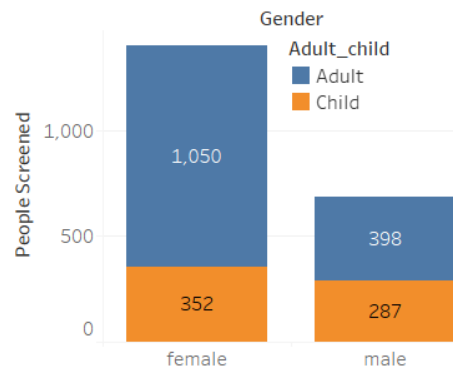
60% of those screened are under the age of 35, consistent with their percentage of the total population.

Fig. 3: Distribution of those screened, by age
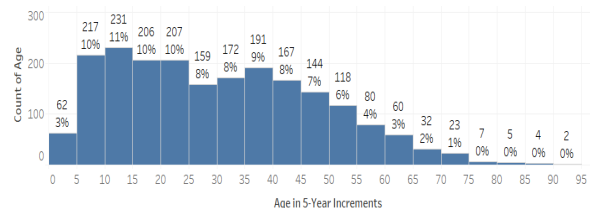
Finally, 65% of participants participated with one or more other members of their family (Figure 4). This is important, as we believe that high rates of participation within families is needed for the behavioral changes to be enduring.

**Figure 4: Members per family screened**
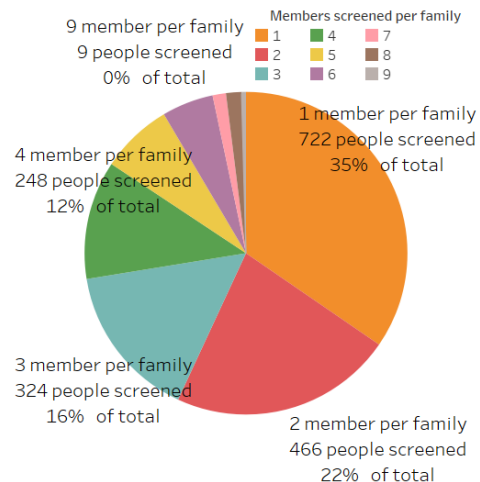
DISCUSSION

Key Learnings about Screening Participation

In the United States, it is estimated only 20% of adults receive an annual preventative health exam[8]. Accounting for both the rural area and the novelty of PPHM in them, the team established a goal of screening 10% of the population in Bhoirymbong block (~3,000 people screened) by the end of June. However, the team quickly encountered challenges to achieving this level of participation. With the intent of increasing both the: 1) number of people screened and 2) the percent of the village population screened, we used the following AIA (Awareness, Interest, Access) funnel to identify problems and create countermeasures.

Awareness depended on the reach and sensitization and mobilization tactics, while **Interest** depended on the tactics' efficiency. Lastly, for a community member that was aware and interested, the screening needed to be **Accessible** - both in terms of location and time. Using the AIA lens, we refined the effectiveness of PPHM's sensitisation and screening capabilities.
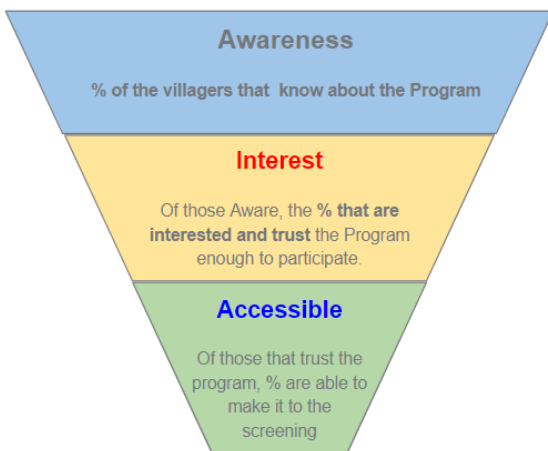
As Figure 5 illustrates, screenings more than doubled in May. This was accomplished by increasing the number of screenings (17 in May versus 10 to 11 per month during February to April) and also increasing average participation

per screening (43 people per screening in May, versus 25 to 30 people per screening in prior months.) The decrease in June corresponded to only 13 screening, due to the onset of the rice paddy planting season. As rice is a key staple, the entire community is involved in supporting this activity that takes place over 2 to 3 weeks. Therefore, screening was paused on June 21st, with a plan to restart in early July.

Fig. 5: Screening by Month
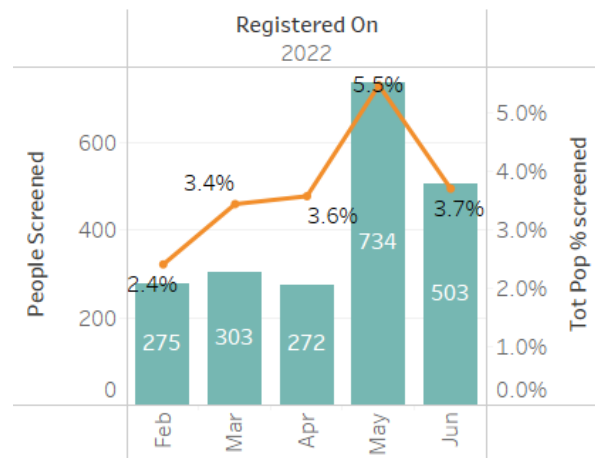
The increase in participation can be attributed to the following changes in screening:

1. Enlisted more stakeholders to build program awareness and credibility.
2. Invested in more tactics to increase awareness.
3. Increased screening and consultation capacity.
4. Multiple screenings within the same village.

The details of these changes are discussed in the following key findings.

#1: Stakeholders

PPHM is a collaboration with the community and multiple village stakeholders. Over the course of the pilot, the understanding of key stakeholders evolved (see Table 1 below). Initially the Block Development Officer (BDO), the village headman,

the ASHA worker, and Anganwadi worker were identified as essential to enlisting the population's support for the screening. However, screening participation increased when the Village Organization president, cluster coordinator, and the Community Health & Gender Activist (CHGA) were also engaged. Knowing the importance of these roles improved the team's efficiency at increasing awareness of and interest in the screenings within each village.

| Figure 6: Seven Key stakeholders	
Stakeholder	**Function**
Village Headman	Leader of village government
Block Development Office (BDO)	Administers schemes of the **Community & Rural Development Ministry** at the block level
Accredited Social Health Activist (ASHA)	Serves as a link from community to public health systems from the **Ministry of Health & Family Welfar**e - attends to the health of the village. Reports to the ANM (Auxiliary Nurse Midwife)
Anganwadi	From the **Ministry of Women & Child Development**, focused on health & nutrition of pregnant & lactating mothers, as well as young children
Village Organization (VO) president	Oversees the federation of Self-Help Groups (SHGs), sponsored by the **Community & Rural Development Ministry** within the village.
Community Health Gender Activist (CHGA)	Provides supports to SHGs and the community in health related activities
Cluster Coordinators	Coordinates with the VOs and SHGs Works with the BDO.

#2: Simple Tactics are more effective at driving awareness

<u>Initial Approach:</u> The sensitisation phase was initially coordinated by university partners with the goal of driving awareness first across the entire block of 60 villages, followed by the screening. However, this meant that some villages were sensitized 2-3 weeks in advance of a scheduled screening day. As Figure 7 shows, there was no correlation between screening response and recency of sensitization, 5 or more days before screening. As a result, the team adopted other tactics to drive awareness:

- Announcements played on the village PA system.
- WhatsApp messages
- Door-to-door visits with ASHA workers.
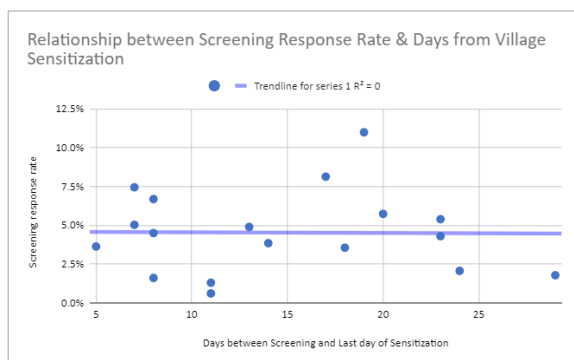
To understand what tactics were most effective, the team added the question, "How did you know about PPHM" to the Screening questionnaire in the MayaPPHM application in late March. It showed that 85% of participants heard about the screening via the PA announcement.

Figure 7:

Relationship between Screening Response Rate & Days from Village Sensitization

| How did you know about PPHM?	People screened	%
Announcement	1,337	87%
Whatsapp forwards	68	4%
Word of mouth	60	4%
ASHA	51	3%
Headman	16	1%
Anganwadi	4	0%
Sensitisation program by MLCU	2	0%
Sensitisation program	2	0%
Sentisation program by MLCU	1	0%
Grand Total	1,541	100%

It should be noted that sensitisation events are still vital to enlisting the key stakeholders / influencers in the villages. Moreover, several villagers shared feedback that sensitization programs provided clarity about the program. Clarity - or lack of it - is shown to impact participation. For example, two villages declined a second screening because they had expected to receive medicines at the first screening.

#3: Capacity bottlenecks impact screening response

Screening capacity: Qualitative and quantitative analysis of registrations showed that for an average screening, the highest rate of registrations happened during a three-hour window in the morning (Fig. 8). People preferred to come in the morning because the blood glucose test required 12 hours of fasting and because of work and/or school responsibilities. This created a queuing problem; the field teams observed that many community members became tired of waiting and left.

Figure 8:

Average Registrations per Village, by hour of day
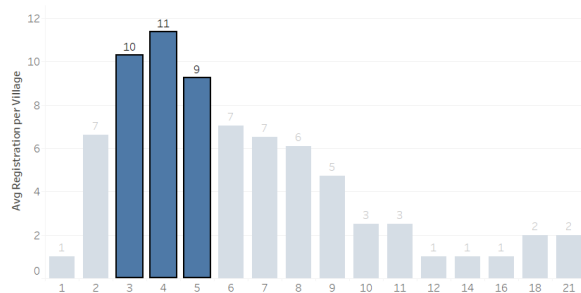
The initial team of two community nurses and two lab technicians, could screen eight to ten patients per hour at an average of six to seven minutes per patient.

To increase capacity, the team was split into pairs, with each pair having one nurse and one lab technician to take blood samples in parallel. This also created the option to host screenings in multiple locations in the larger villages, thereby increasing access.

Consultations by MLHPs: Another key constraint was that an MLHP was only performing five to six consultations in a day because of other responsibilities. This meant that every screening of 30 people required two days of teleconsultations by the team of three MLHPs.

To address this bottleneck, the SVM team coordinated with the e-Sanjeevani team to increase the number of teleconsultation hours.

#4: Repeat Screenings have higher participation

Through the first three months of the pilot, the team observed that the household participation of 13% was nearly 3.7xs greater than the population participation of 3.6%. This confirmed the expectation of partial household participation, given the large households and lower participation rates of men and children. Indeed, 62% of those screened from February to April represented just one to two members in a household.

Screening, February - April, 2022

Villages	Responses	Tot Pop % screened	Families Screened	Households screened %
34	850	3.6%	547	13.3%

In May, the team tested a strategy of rescreening villages based on the hypothesis that turnout would be higher given familiarity with PPHM and increase participation rates within families (Figure 9).

Figure 9: Screening Responses in rescreened villages, May:

| Village	Responses		
	Feb	Mar	May ⇅
Lumsohpieng	24	1	117
Lumdaitkhla	51		95
Umktieh A, B, C, D	62		72
Palwi		26	54
Umket	45		41
Umdohbyrtih	38		39
Pynthor		36	38
Mynsain		57	38
Lumblei		12	28
Umshaproh		24	20
Umden Umbathiang		33	6
Grand Total	220	189	548

Eleven previously screened Villages were selected for a second screening. Seven of those villages had a higher response. Moreover, while second screenings reached new households, 11% of the participants, in the second screening, came from previously-screened households.

These results demonstrated that subsequent screenings within a village are an essential element for PPHM to move forward. However, there is still work required to convince participating households to send remaining members who have not been screened. There is sufficient evidence that high screening rates within households are critical for ongoing participation in PPHM.

#5: Find new ways to increase access to screening

To better understand community awareness and sentiment towards PPHM, the team ran a small community survey following screening in 18 villages and collected 53 responses. Among respondents, 43% were aware of the screening but did not attend. The most common reason for not attending was a "busy schedule". Moreover, of those 43%, 70% were interested in attending a screening if the team came back to their village.

If we came back to your village for another health screening, would you be interested in attending?
35 responses

- Yes
- No
- Maybe/Not sure
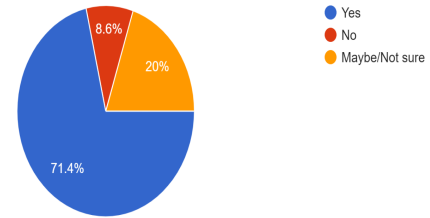
It is important to identify other days and times when screenings can take place in the village. It must also be concluded that "being too busy" can be a polite way for people to say they are not interested. Therefore, we must continue to explore ways to make the screenings interesting and meaningful.

Application of Learnings: Lumsohpieng

One of the villages screened a second time was Lumsohpieng, a village of more than 1,000 people and 200 households, located about 34 kilometers northeast of Shillong. Only 24 people participated when Lumsophieng was screened in February for the first time.

On May 20th, the PPHM team coordinated another sensitisation in the village and enlisted local influencers. People from nearby villages also came to the event. At this time, the team learned about the upcoming monthly Village Organization meeting, on May 25th, at which they held yet another sensitization session. Lastly, the team tried a new tactic of printing posters of the Whatsapp message, advertising PPHM for display in local shops.

Screening was then conducted on May 28th in two different locations in the village and began in the early morning. The result was that 117 people were screened - the most to-date. From this experiment, the team learned new tactics that helped increase awareness, interest, and access to the screening process.

CONCLUSIONS & RECOMMENDATIONS

This first impact study shows how awareness and health-seeking behavior of PPHM screenings was tested and refined. Much was learnt about the ground reality of screenings providing key lessons for what works and what does not work in rural communities. Most importantly, in the early stages of PPHM, we have identified health pathways for individuals needing treatments. These pathways will be addressed in future reports and studies.

Innovative methods for mobilization and engaging the Village Organization platform along with other village-level groups has been very effective. This has been made possible by the support of the Block Level administration, the CHC, along with a few changes made to the deployment of human resources in the field. These changes have been incorporated in our research and analysis in strategic planning.

Although some deterrents like bad weather conditions, technical glitches, and the unwillingness of some people to participate may be perennial challenges, we believe that we will be able to overcome them as we forge ahead.

The next phases of study for PPHM will address the intended role of Village Health Councils and how they can leverage the PPHM model for the healthcare system in a number of other states working with the SVM in India.

In addition, we will create and test more hypotheses to increase participation in health screenings. For example, given more women are coming, how can we leverage women to increase participation in their households. Once high participation within specific households has been established, how can we then leverage trust to increase participation in the entire village? Additionally, we want to explore the impact of other tactics on population engagement, such as games, friendly competition between villages, provisioning of nutritional supplements, and educational activities during screening.

Moreover, the capability and impact of PPHM should be further refined and explored in three areas:

1. **Engagement beyond screening**: Understanding what factors increase engagement with PPHM during and beyond the diagnostic phase. This includes studying the factors that drive active usage of telemedicine technology and measure the macro/micro reach of technology - i.e. speed to adoption within the village.
2. **Expanding Reach:** Understand how to promote health-seeking behavior among those who would not normally engage with the healthcare system.
3. **Return on Investment**: Predict and test how PPHM could allow the healthcare system in Meghalaya to reduce the average cost of providing patient services.

We look forward to contributing to long-term studies and community action plans that achieve the goal of PPHM ensuring economic access to universal health care.

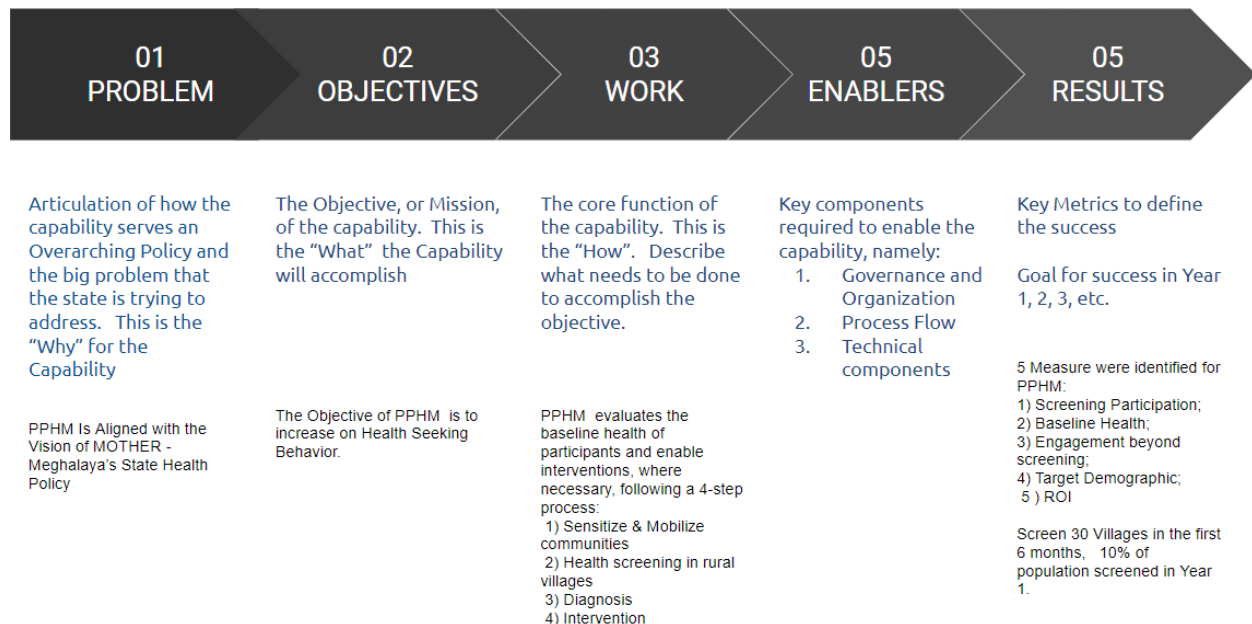# POSTSCRIPT: A NEW FRAMEWORK FOR BUILDING CAPABILITIES

From this pilot we developed a scalable model to apply PPHM and similar concepts to other regions. This model integrates the work of many before us that developed tools and templates such as the **Business Model Canvas,** the **OGSM** (Objectives, Goals, Strategies, and Measures) goal setting and action plan framework,   and **the Triple-Helix model of Innovation.**   This new model integrates these frameworks with the unique challenges and opportunities that come with government-driven changes to create what we have called the **POWER MODEL**

 The **POWER** of a capability, or concept, is grounded on the:

1. Importance of the **Problem**
2. Capability's **Objective**
3. Clarity and relevance of the **Work**
4. Strength of its **Enablers**
5. Feasibility and specificity of **Results**

This framework is illustrated in the chart below, and we explain each component in more detail, using PPHM as an example.

POWER FRAMEWORK FOR CAPABILITY BUILDING

01 PROBLEM	02 OBJECTIVES	03 WORK	05 ENABLERS	05 RESULTS
Articulation of how the capability serves an Overarching Policy and the big problem that the state is trying to address. This is the "Why" for the Capability	The Objective, or Mission, of the capability. This is the "What" the Capability will accomplish	The core function of the capability. This is the "How". Describe what needs to be done to accomplish the objective.	Key components required to enable the capability, namely: 1. Governance and Organization 2. Process Flow 3. Technical components	Key Metrics to define the success Goal for success in Year 1, 2, 3, etc.
PPHM Is Aligned with the Vision of MOTHER - Meghalaya's State Health Policy	The Objective of PPHM is to increase on Health Seeking Behavior.	PPHM evaluates the baseline health of participants and enable interventions, where necessary, following a 4-step process: 1) Sensitize & Mobilize communities 2) Health screening in rural villages 3) Diagnosis 4) Intervention		5 Measure were identified for PPHM: 1) Screening Participation; 2) Baseline Health; 3) Engagement beyond screening; 4) Target Demographic; 5) ROI Screen 30 Villages in the first 6 months, 10% of population screened in Year 1.

1.   Problem - Know the Problem & the Policy your solution serves - "the Why"

Public Policy initiatives require a clearly defined policy that is funded; empowered to achieve its mission; and focused on solving a "burning platform" problem.   In the case of PPHM, the Government of Meghalaya wanted to improve Maternal health and increase life expectancy. And from this policy came the vision to flip the state's health paradigm from *disease management* to *disease prevention*. The focus on disease prevention became the impetus for PPHM.

Businesses and other organizations will often use a *Vision* statement. The underlying need to articulate *the aspiration of the organization* and the overarching reason for the organization to exist are vital. The Policy encapsulates the reason for a capability to exist and central within this Policy is the **Problem Statement**. Powerful projects are grounded in well-informed policies and meaningful problems.

PPHM CONCEPT & STATE HEALTH POLICY — Smart Village Movement™ In Alliance With Berkeley Haas
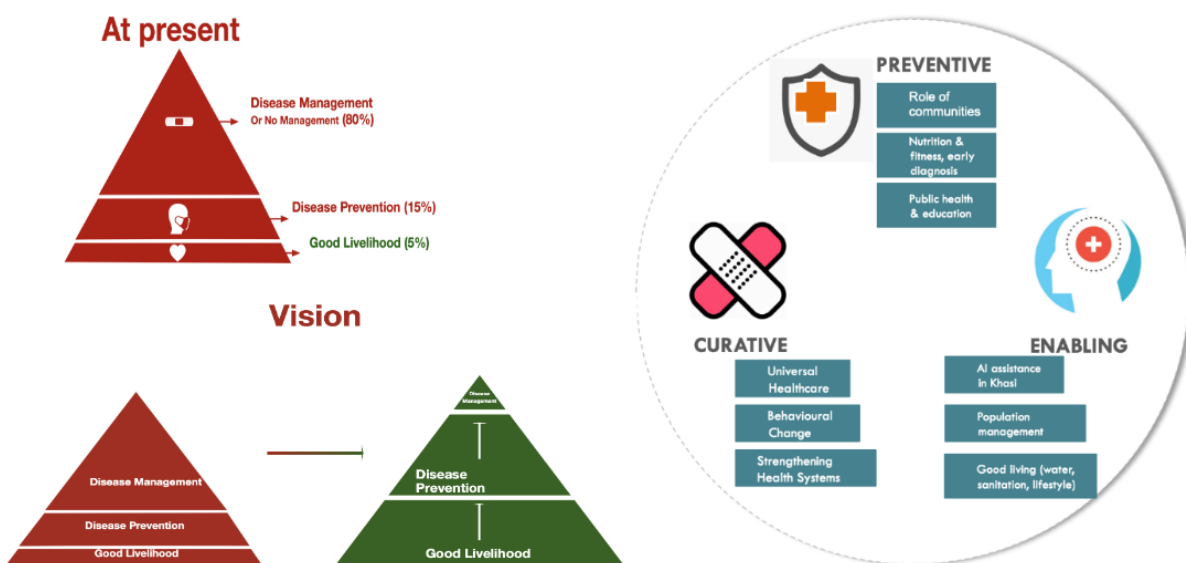
2. Objective - "The What"

The Objective articulates *what the capability needs to achieve*. Oftentimes, organizations will define a "Mission statement" to describe who they are and why they exist. From our experience, Mission statements can become detached from the practical realities the team faces and often fall victim to word-smithing workshops that distract their members.

However, whether your organization spends time crafting and recrafting Mission statements, strategy plans, guiding principles, and visions, it still needs a clear objective. The objective should be simple, clear, and compelling. The objective for PPHM is simply to "Increase health-seeking Behavior".

3. Work - "The How"

Once you have defined the objective, the next step is to describe the value that needs to be created. Sometimes this is broken down into "Strategies" and "Initiatives". Businesses may use the "Value Proposition" and "Key Activities" in the Business model Canvas to describe this work. And once again, we have observed organizations expend time on verbiage and debate over whether something is a "strategy" or an "initiative." All one needs to do is describe *What* needs to be done to accomplish the objective.

For PPHM, the Work is outlined in a 4-step process designed to evaluate the baseline health of participants and enable interventions where necessary. This is not to say that arriving at the Work is an easy and linear process. In the case of PPHM, multiple design sessions were held with a consortium of stakeholders to identify the 4-step approach to pilot.

PPHM WORK	
STEP	Expected Impact
1. Sensitisation & Mobilization	1. Baseline Learning - informs structure/approach to subsequent Steps 2. Increase both **level** and **quality** of participation in subsequent steps.
2. Screening (with Maya MD app)	1. Data - Baseline learning - about health in screened population 2. Proper diagnosis 3. Increased level of **Interest** in healthy behaviors & practices
3. Diagnosis	1. Preventative Health
4. Intervention	1. Population engages with health Working groups → Adoption of healthy behaviors 2. Engagement with Maya App → Higher rate of wellness checks 3. Timely Check-ups, follow-ups & referrals.

4. Enablers - "The Who"

The process of defining the Work also elucidates the network of enablers needed to sustain it. In this section the key components of the capability should be identified, namely:

A. **G**overnance and Organization
B. **P**rocess Flow
C. **T**echnical components

For PPHM, we leveraged the Smart Village triple-helix model of innovation - integrating Government, Non-Profit, and Private enterprise - to enable the pilot. The government sponsored the work and empowered the teams. Without this sponsorship, it would have been impossible for the field teams to effectively engage with village communities at the speed that they did. It is critical that government agencies have a strong rapport with the communities they serve. It is also vital that a high-ranking government official is actively involved in the project for two reasons: First, they need to advocate for the program, and second, they will be needed to make decisions on the scope & scale of the program.

Nonprofits can be valuable intermediaries between 1) enterprise and government and 2) Village communities and private companies. The Smart Village Movement has first-hand knowledge of village communities and direct relationships with the Government, making it an invaluable connector between the different groups. In this way, the Non-Profit functions as the "General contractor", identifying and integrating different companies required to enable the end-to-end solution.

Within the Enable section, it is important to also map the high-level process of the program. This process details the key activities, critical roles, and enablers for each step of work. From this exercise, you should have a document that becomes the starting point for the project managers to create more detailed

PPHM: HEALTH SCREENING FLOW — Smart Village Movement™ In Alliance With Berkeley Haas

	01 Mobilize (Days 1-2)	02 Screen (Day 3)	03 Analyze (Day 4)	04 Intervene (Day 5-6)
Key Activities	1. **Enlist/notify** Village leadership & local health practitioners 2. **Identify** relevant marketing mix 3. **Create** relevant marketing communications 4. **Advertise** screening	For each patient: 1. **Intake:** Create, or update, digital health record 2. **Health survey** 3. **Collect** & deliver blood samples to lab	1. **Perform** blood sample diagnostics per age group 2. **Lab transfers Data** to patients health record. 3. Healthcare app **generates patient's health report & recommends next steps**	1. **Professional review** of health reports by Nurse/Doctor 2. If no interventions are needed, **deliver health reports** to patients. 3. Else, patient **consultation**
Critical roles	Program coordinator **Mobilization Team**	Program coordinator **Field Screening team:** (i.e. Nurse & Lab Technician)	**Lab technician** **Health Systems Administrator**	**Doctor** (to review flagge reports) **Nurse** (for patient consultation **Field healthcare worker** (to deliver heath reports)
Enablers	Calendar or prioritized list of Villages to screen Data on health of village	Screening locations AI-Enabled Health care app to create & update health records	Lab to Analyze Blood Samples Healthcare app	

workflows, timelines, communication plans, and other supporting documentation.

The third element to Enablers is the core technical capability. For this process to function, a system for creating, managing, and analyzing health records is needed. Ideally, this system leverages AI to better analyze health data, recommend healthcare pathways, and track and prompt patient compliance. In the Meghalaya pilot, Maya MD was the provider. A technical architecture map should be included to help the team understand and communicate the necessary technical elements.

For PPHM, MayaMD provided the following technical map to show how its AI-Enabled technology would support the Screening; provide a Health Assessment; support Care Programmes; and provide stakeholders with both a health database and Analytics.

AI ENABLED TECHNOLOGY CAPABILITIES — Smart Village Movement™ In Alliance With Berkeley Haas
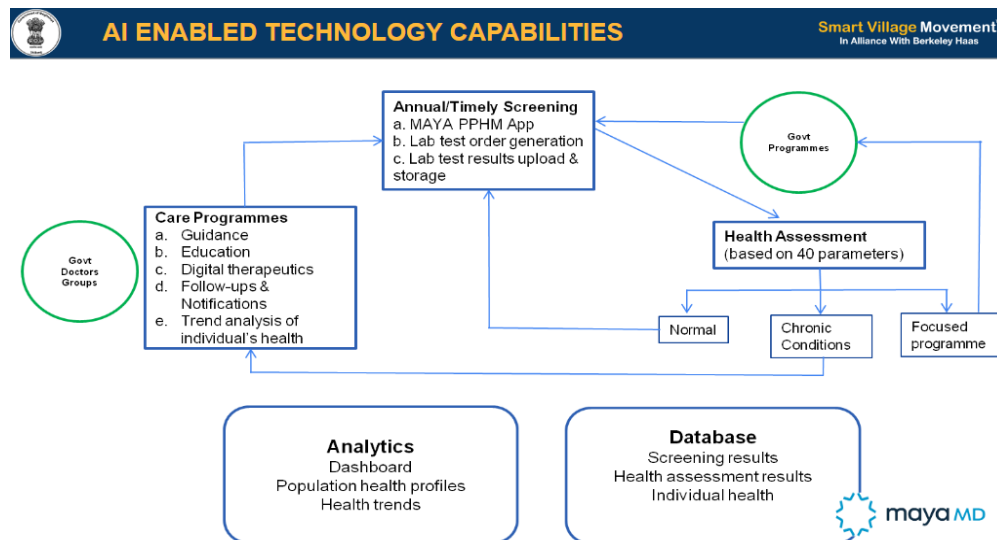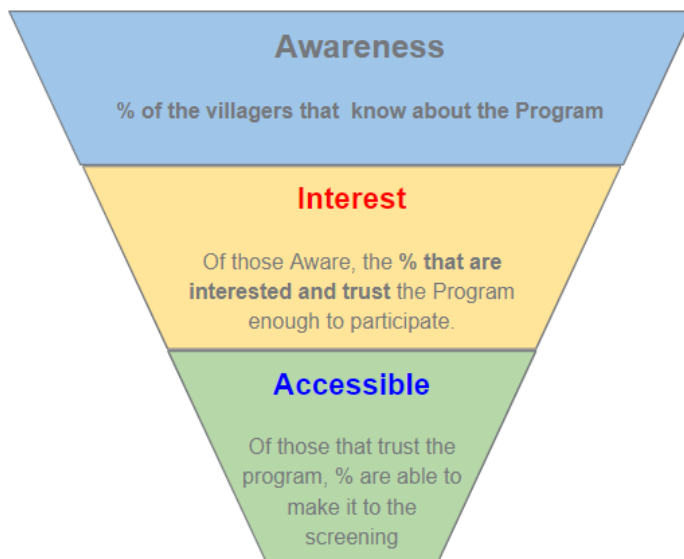
5. Results

With the Problem, Objective, Work, and Enablers defined, the final step is to commit to results. Results include the Phases, Scope, Metrics, and Milestones that one might see in OGSM documents, Project charters, or research plans.

Once again, you can add as much, or a little detail and sub-sections as needed, but what matters most is clarity and specificity. This section is most valuable in aligning desired outcomes with the expectations of various stakeholders.

To that end, we found it was worthwhile to identify and then prioritize 5 key *learning objectives* for PPHM. For instance, while the Government was interested in understanding ROI, it was most important to first understand factors that impacted Screening Participation. And within this metric, we aligned on a goal of 3,000 individuals screened for the Pilot.

We have identified 5 Objectives to Assess the Impact of PPHM *as a Strategy*

We are addressing these in first Impact study	**1** Screening Participation	• Understand factors that drive participation in screening • Increase participation in screening to 10%, for total of 3,000 individuals screened by June 30th, 2022
	2 Baseline Health	• Understand the baseline of health & health-seeking behavior in the screened population and determine what differences/improvements would be meaningful.
We plan to address these second.	**3** Engagement beyond Screening	• Understand what factors increase engagement with PPHM during and beyond the diagnostic phase • Understand the factors that drive active usage of the Telemedicine Technology • Measure Macro/Micro Reach of Technology - i.e. speed to adoption within Village
	4 Target Demographic	• Understand how well we are reaching our target demographic. • Target Demographic: Those who would improve the most, across the 43 Health indicators, by improving their health-seeking behavior.
	5 ROI	• Predict and test how PPHM could allow the Universal Healthcare system in Meghalaya to reduce the average cost to serve a patient • "Ounce of prevention worth a pound of cure"

Awareness

% of the villagers that know about the Program

Interest

Of those Aware, the **% that are interested and trust** the Program enough to participate.

Accessible

Of those that trust the program, % are able to make it to the screening

As we studied screening participation, we created and data collection plans to assess Key metrics for Awareness, Interest, and Access.

The results section gives you the opportunity to align on expectations and envision phases of the project, and key success metrics for each phase (i.e. Proof of Concept → Pilot → Scale-up phase 1).

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APPENDIX

1. **List of 40 Health Parameters & Lab Interventions** (source: Dr. Anil Shah, Chairman of the SVM; Dr. Vipindas Chengat, Founder & Chairman, MayaMD.ai; Dr. Tyngshainlang Sutnga, Medical Officer, Bhoirymbong CHC)

Parameter	Lab Interventions	Parameter	Lab Interventions
1. Adolescent Pregnancy (Prevention)	UPT. USG	21. Iron Deficiency	CBC, Sr. Ferritin, Stool test -RE (Ova & Cyst), TIBC Serum B12, Sickle cell. G6PD
2. Alcohol Consumption	KFT, LFT, Lipid Profile, Sr. Amylase	22. Malaria (Prevention Strategies)	Malaria, blood Glucose level
3. Anemia	CBC, Sr. Ferritin, Stool test -RE (Ova & Cyst), TIBC Serum B12, Sickle cell. G6PD	23. Malnutrition	Serum Proteins & Albumin
4. Antenatal Care (F)	Routine tests & USG,	24. Maternal mortality	Normal Routine test (CBC, Blood grouping RH incompatibility)
5. Arthritis	RA factors, Serum. Uric Acid, ASO-titre, CRP	25. Measles Vaccination	
6. Asthma	Radiological Investigation, ESR & CRP	26. Mental Disorders	LFT & KFT after every three months
7. Blood Availability Platform (Donation/ Blood Banks/Surgery Centres)	At the DH/SDH level (MP, Syphilis, HIC, Hep B & C then BT CT, RH Complete & grouping)	27. Obesity, Including Childhood Obesity	ADIPONECTIN Test , lipid profile,
8. Cancer	VIA, PAP (Cytology, FNAC, ANA, Cancer marker test,- Can be done at DH level)	28. Oral & Dental Diseases including Oral Cancer, Gingivitis, Parodontitis etc.	Normal Routine test. X-Ray-OPG. FNAC (can be made available at DH)
9. Cataract	Normal Routine test	29. Pneumonia & Pertussis (Vaccination)	Radiological test & ESR
10. Children under 5 who are stunted	Whole CBC, LFT, KFT with Serum electrolytes	30. Prevention Of Trauma	
11. Children under 5 who are wasted		31. Renal Diseases	RFT
12. Congenital anomalies	USG. (ECHO- Can be done at DH level)	32. Tobacco Consumption and Smoking	All routine tests (Alcohol-LFT Serum Amylase & Lipase)
13. Dentofacial anomalies and malocclusion	X-ray -OPG machine and Normal routine blood test	33. Tuberculosis (Prevention and Detection)	AFB, TrueNat X ray.
14. Diabetes	RBS, HBA1C, Serum Glucagon, GTT	34. Vitamin B-12 Deficiency	Vitamin B12 assay
15. Diarrheal disease	Normal routine blood test, Stool ova & cyst test (Stool culture & sensitivity- at the DH level)	35. Vitamin D Deficiency	Vitamin D assay
16. Drug Abuse	LFT	36. Hb, WBC with differential (once), BUN,	CBC, RFT KFT , RBS

			Blood Glucose, Liver Enzymes (once), Cholesterol with LDL.
17. Folic Acid Deficiency	Serum. Folic acid. B12 , Sickle cell.	37. Gastro-intestinal/ water-borne ailments	Routine tests depends on patients
18. Hypertension	Lipid profile, LFT & KFT, RBS	38. Dog bite	
19. Infant mortality	X ray, & routine test	39. Snake bite	
20. Influenza		40. Scrub typhus	Scrub typhus test- Rapid , Weil Felix (NA)

2. **State of Meghalaya & Ri Bhoi District**

3. **AI Enabled Technology Capabilities of MayaMD**
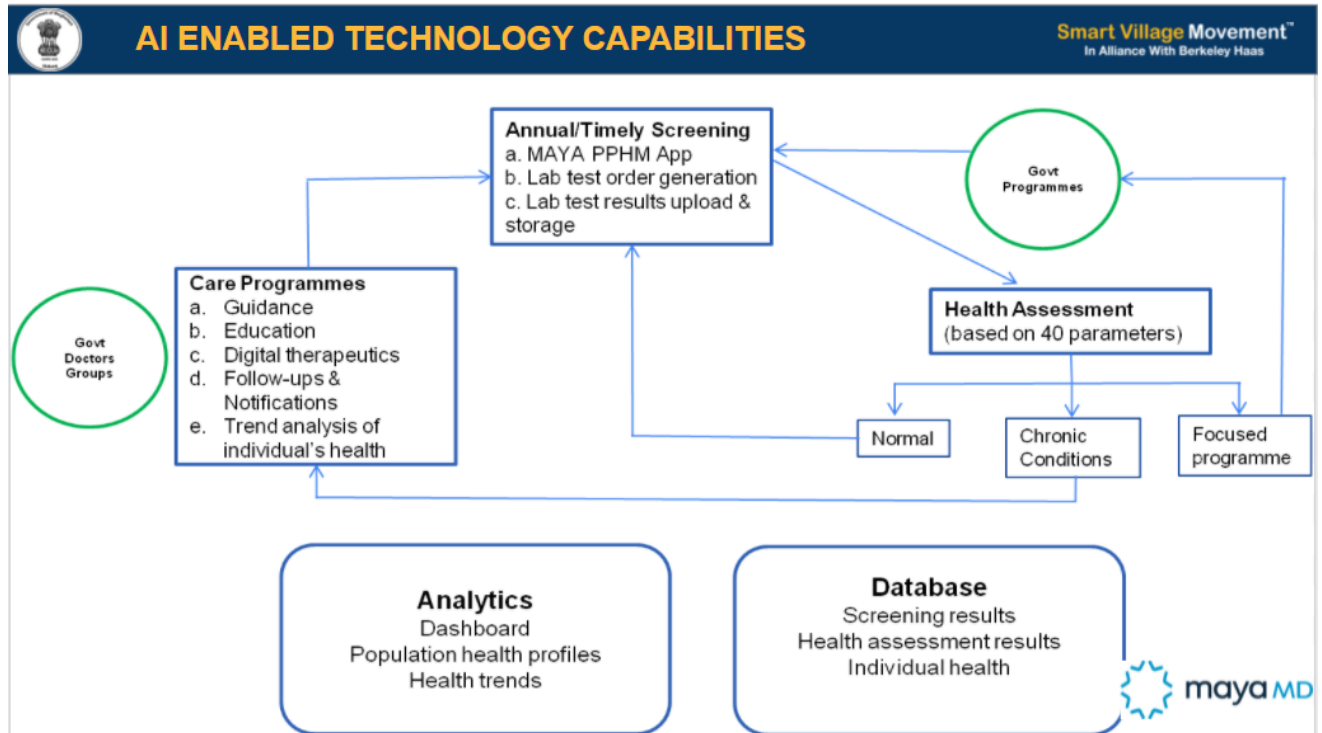
4. Map of Villages Screened, Sized by number of People Screened and Colored by Sub-centre

Map: People Screened by Village