

# ICTPH Model for the Provision of Primary Care at the Village Level<sup>1</sup>

## Introduction

Primary care is an important component of any high performing healthcare system and to be effective it needs to provide a substantive amount of healthcare services very close to where the people live. A model of healthcare that relies solely on various kinds of informal, poorly trained workers who provide some advice and then refer patients to higher levels of care being provided in far off locations tends to build mass at hospital based settings and has the effect of increasing system level costs, high levels of overcrowding at these facilities, improper use of scarce medical resources, and does not eventually end up delivering wellness outcomes for the communities that it seeks to serve.

The IKP Centre for Technologies in Public Health ([www.ictph.org.in](http://www.ictph.org.in)) is an organization that is focused on researching these issues, developing effective designs, and the piloting them on the ground along with local healthcare partners. This note describes the model for the provision of primary care at the village level that has been developed by ICTPH and has been piloted on the ground in seven locations in rural Thanjavur in Tamil Nadu by Sughavazhvu Healthcare – a local healthcare provider. This model attempts to reverse the flow of patients from higher levels of care to lower and more proximate levels of care and will hopefully fit into a broader primary care focussed design of the Indian healthcare system.

## Key Design Elements

The ICTPH Primary Care Model has six key design elements:

1. Detailed Mapping and Enrolment: A granular and complete knowledge of the local geography and the each resident living in it.
2. Local Health Centre: A Rural Micro Health Centre located at the 5000 to 10000 population level providing a broad range of healthcare solutions that are appropriate for primary care settings. This would be sub-centre in public health system.
3. Risk Stratification: Risk stratification of the local population using both the mapping data from the village as well as the data gathered from patient visits to the RMHC, and development of variety of engagement strategies to address these risks.
4. Treatment Protocols: Careful development of detailed treatment protocols which go well beyond standard treatment guidelines.
5. Health Management Information System: An electronic health records system that is used to track each patient, guide the healthcare workers in the diagnosis and treatment of patients at the RMHC, help in the risk stratification of the served population, help audit the performance of the RMHC on all the relevant dimensions, inventory management, and accounting.
6. Bridge Training Programmes: Each RMHC is staffed by a formally qualified and legally eligible physician trained either as an allopath or in the three indigenous systems of medicine, and a locally hired Health Extension Worker. The training and certification of these two in the

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<sup>1</sup> ICTPH stands for the IKP Centre for Technologies in Public Health ([www.ictph.org.in](http://www.ictph.org.in)).

provision of formal allopathic care is done using the Bridge Training Programmes designed by ICTPH.

In the following sections each of these design elements will be discussed in some detail.

### Detailed Mapping and Enrolment

Once a village location for the establishment of an RMHC is identified a group of local youth are hired on a contractual basis for a period of two months. They are each given a mobile phone which operates using the Android Operating System. The phone has loaded on an internally designed software programme<sup>2</sup> designed to assist them in their enrolment exercise. Before the enrolment team begins its work the team assigned to roll out the RMHC does a detailed village level mapping and develops a master database of road names and hamlets so that the enrolment team is then simply required to select from the pre-populated list of names instead of entering them each time. This accelerates the process of enrolment as well as ensures that there are no errors in capturing the address of each family. At the end of this exercise each household is given a bar-coded card which, ideally, they are required to bring to the RMHC. The RMHC database also has a GPS<sup>3</sup> marker (latitude and longitude) for each household allowing to accurately locate each household on a map of the village. Given below is a map of the settlements surrounding the Andipatti RMHC in Thanjavur with each enrolled household clearly marked out – the red plus sign indicates the location of the RMHC.



### Local Health Centre

The local health centre operates from a locally rented 400 square foot premise and is staffed by a formally qualified physician and a locally hired health extension worker. The physician is formally qualified in the practice of one of three forms of indigenous medicine (Ayurveda, Unani, and Siddha) and is legally authorised<sup>4</sup> to practice allopathic medicine. While the number of MBBS / MD physicians is limited and is perhaps barely adequate to provide secondary and tertiary care in India, there is an adequate supply of these physicians, and given the constraints of the job market for them, they are also very willing to serve in rural locations<sup>5</sup>.

<sup>2</sup> <http://www.ictph.org.in/downloads/ICTPH%20Mobile%20Enrolment.pdf>

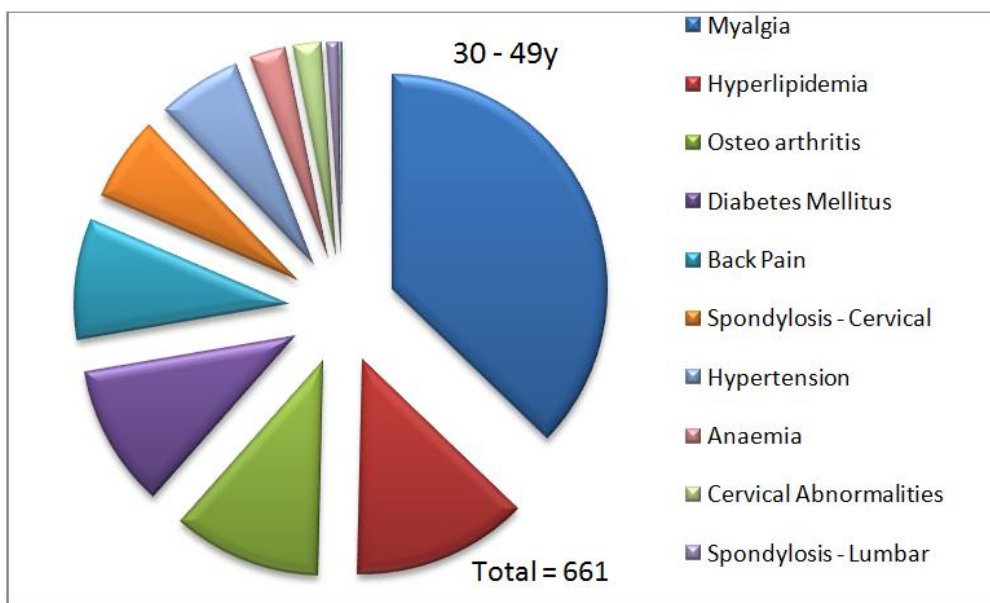
<sup>3</sup> <http://www.gps.gov/>

<sup>4</sup> <http://ictph.org.in/blog/from-the-president-zeenas-note/tackling-a-primary-shortage-states-can-specify-minimum-sub-mbbs-skills-to-increase-the-supply-of-healthcare-providers/>

<sup>5</sup> <http://ictph.org.in/blog/from-the-president-zeenas-note/where-are-the-doctors-allopathic-doctors-in-short-supply-need-for-trained-practitioners-of-alternative-medicine/>



The local health centre (or RMHC) offers a broad range of healthcare services. Given the size of the chronic disease burden as well as the wide range of observed conditions on the ground<sup>6</sup>, the RMHC provides treatment for:



1. Cardio Vascular Diseases<sup>7</sup> -- both counselling as well as treatment.
2. Anaemia including presumptive supplementation through Sprinkles<sup>8</sup> for children between the ages of 6 months to 60 months.
3. Oral Health<sup>9</sup> which includes scaling and temporary fillings (using Atraumatic Restorative Techniques or ART<sup>10</sup>).
4. Women's Health and Cervical Cancer<sup>11</sup>

<sup>6</sup> <http://ictph.org.in/blog/research/analysing-patient-data-at-sughavazhvu-%e2%80%93-chief-complaints-and-diagnoses-of-patients-belonging-to-different-age-groups/>

<sup>7</sup> <http://ictph.org.in/blog/interventions/ictph%e2%80%99s-cvd-intervention-evaluation-defining-and-refining-goals/>

<sup>8</sup> <http://ictph.org.in/blog/nutritional-deficiencies/infant-home-fortification-through-sprinkles-a-case-study/>

<sup>9</sup> This includes treatment for the following diseases conditions – glossitis, angular cheilitis, aphthous ulcer, herpetic labialis, gingivitis, dental fluorosis, dental caries. The services offered are - Atraumatic Restorative Treatment (ART), Scaling, medication for oral lesions, oral health education

(<http://ictph.org.in/blog/interventions/ictph-launches-oral-health-intervention-at-allakudi-rural-micro-health-centre/>).

<sup>10</sup> <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1449363/>



5. Reproductive Health<sup>12</sup>
6. Ophthalmic care<sup>13</sup> including detection of refractive errors, provision of eye-glasses, and detection of mature cataracts.



7. Wide range of acute conditions.
8. Mental Health – both counselling and treatment of depression, anxiety disorders, and insomnia<sup>14</sup>.

When necessary the RMHC also collects and centrifuges blood samples for collection and onward transmission to a nearby diagnostic centre<sup>15</sup>. The RMHC also directly dispenses all the drugs necessary for the treatment of the patient condition.

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<sup>11</sup> <http://ictph.org.in/blog/interventions/launch-of-the-women%e2%80%99s-health-intervention-at-karambayam-rural-micro-health-centre/>

<sup>12</sup> <http://ictph.org.in/blog/interventions/ictph-womens-health-intervention-targeting-reproductive-health/>

<sup>13</sup> <http://ictph.org.in/blog/interventions/ictph-launches-its-primary-care-ophthalmic-intervention/>

<sup>14</sup> To be launched shortly. Design being finalized.

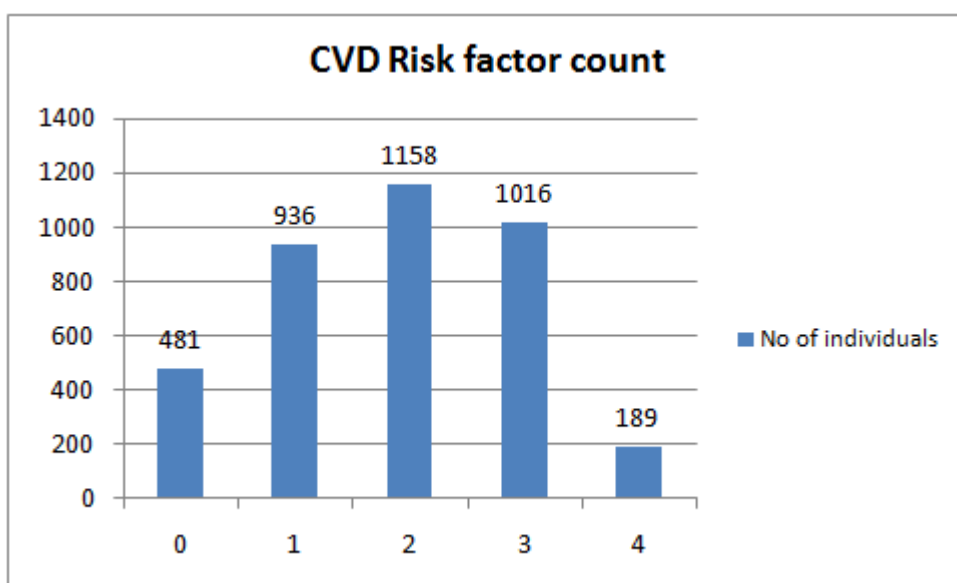
<sup>15</sup> In the ICTPH model a network of ten RMHCs would include one fully staffed diagnostic centre with a KX-21 and CHEM-7 machine so that it able to offer complete blood counts and blood chemistry reports quickly and at a low cost. For example, the current Sughavazhvu Healthcare diagnostic centre offers: Haematology – Complete Blood Count (CBC) provisioned through a Sysmex KX-21 Autoanalyzer allowing for Haemoglobin, WBC, RBC, Haematocrit, MCV, MCH, MCHC, Platelets along with other relevant CBC parameter assessment through 2ml of venous blood, with a turnaround time of less than a day. Multiple biochemical parameters – blood glucose (random, fasting, post prandial, GTT), urea, creatinine, uric acid, lipid profile (triglycerides, total cholesterol, HDL), Liver Function Test (LFT) (SGOT, SGPT, Albumin, bilirubin total, bilirubin direct), HbA1C, Magnesium are all performed on a semi-autoanalyser CHEM-7 requiring 5ml venous blood





## Risk Stratification

Once the enrolment is completed and the RMHC is successfully launched, the enrolment team goes out again and over a period of 6 weeks completes the Rapid Risk Assessment<sup>16</sup> of each individual living in the community. The software programme automatically prompts the enrolment agent to provide an appropriate risk card to individuals that are determined by the software to be categorised as high risk on account of their pregnancy status, age, Body Mass Index, Waist Hip Ratio, Blood Pressure, and / or family history. This risk card allows the individual to visit the RMHC for a more detailed examination by the physician as well as additional diagnostic tests. The chart given below gives the distribution of the number of CVD risk factors for the village of Karambayam:

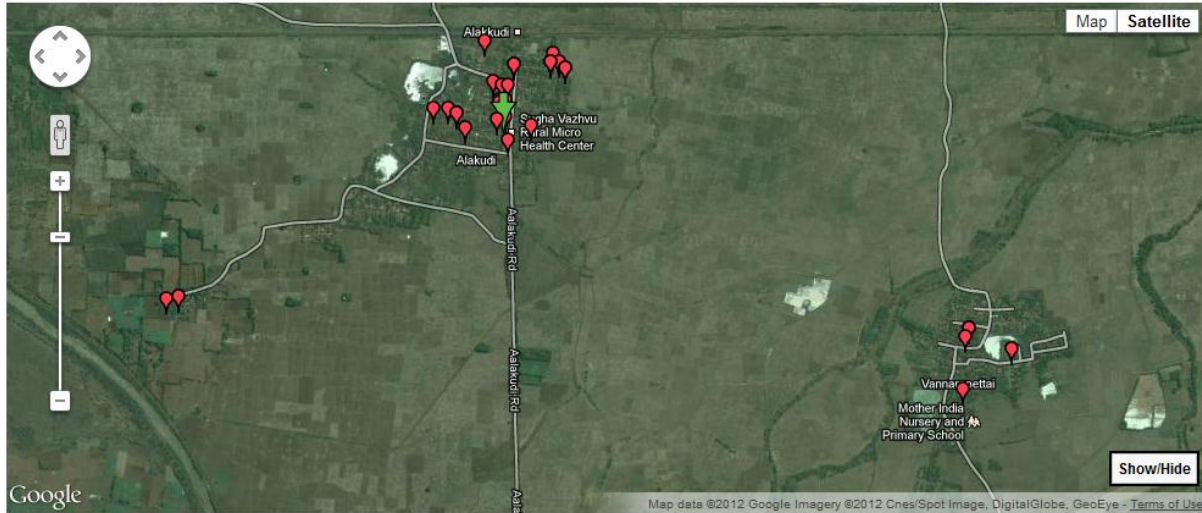


The physician at the RMHC is also able to carry out landscape epidemiology<sup>17</sup> based on a combination of the use of the patient identity number at the clinic, the diagnosis at the RMHC, and the GPS coordinates associated with the patient identity number. This, for example, allows the Physician to localise the out-break of say, diarrhoea, to a specific cluster of households and then work with the local government to test the water in that area and take corrective steps. Another

<sup>16</sup> The RRA captures Marital Status, Pregnancy, Blood Pressure, Anthropometric Measures – weight, height, waist and hip circumference, Personal History – diabetes and blood pressure, tobacco consumption (chewing or smoking), Women’s Health – inter menstrual bleeding and post-coital bleeding in the last three months for all adults in our catchment population (<http://ictph.org.in/blog/health-technology/the-launch-of-mobile-phone-based-rapid-risk-profiling-of-our-populations/>).

<sup>17</sup> [http://en.wikipedia.org/wiki/Landscape\\_epidemiology](http://en.wikipedia.org/wiki/Landscape_epidemiology)

approach that can be used by the RHMC is to conduct targeted treatment, prevention, educational camps<sup>18</sup> at the RMHC or within the community based on the observed risk profile of the population. Given below is a map for the recent visitors to the Alakudi RMHC of Sughavazhvu who were diagnosed as suffering from Allergic Pharyngitis. Notice that the clustering at two specific points in the village that bears further examination.



## Treatment Protocols

In order to carefully control the quality of treatment offered to the patient the ICTPH Model requires each member of the RMHC to follow a very detailed set of protocols for the treatment of each condition<sup>19</sup>. The go far beyond the Standard Treatment Guidelines (in terms of detail) such as those developed by the Armed Forces Medical College (AFMC) or the Tamil Nadu government. The process of patient management within each RMHC is also detailed out very clearly. For example, in addition to being treated by the physician, each patient goes through a detailed screening<sup>20</sup> conducted by the Health Extension worker (HEW) which forms a part of the patient record. Each physician is required to adhere to the internationally established SOAP protocol<sup>21</sup> for the examination and treatment of each patient – this too is clearly laid out. All of these protocols also form an integral part of the training of each physician.

## Health Management Information System (HMIS)

ICTPH has developed a strong HMIS<sup>22</sup> to track and control each part of the functioning of the RMHC including: (a) adherence to protocols; (b) accounting; (c) inventory management; and (d) tracking of outcomes. The HMIS also allows a detailed audit<sup>23</sup> of the work of each physician. After several iterations the HMIS has been designed to work smoothly in an RHMC environment. For example, it allows data-capture using only drop-down options (instead of free-text) which reduces the time required by the physician to enter this data and also makes an automated analysis of it

<sup>18</sup> <http://ictph.org.in/blog/training-development/camp-based-approach-to-community-engagement-and-human-resource-training/>

<sup>19</sup> <http://ictph.org.in/downloads/ICTPH%20Protocolised%20Patient%20Management.pdf>

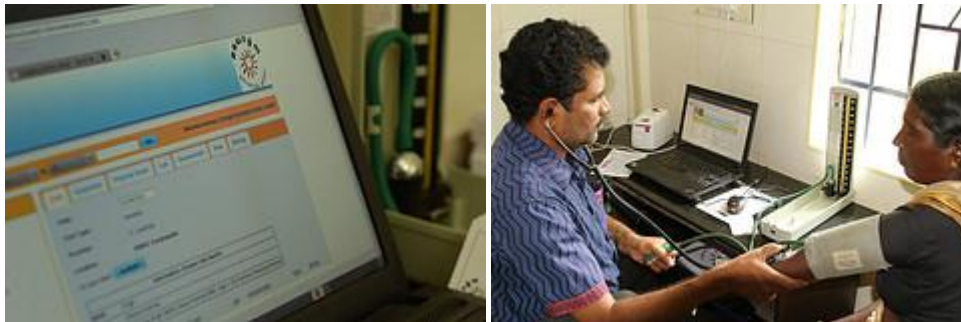
<sup>20</sup> <http://ictph.org.in/downloads/ICTPH%20Population%20based%20Individual%20Screening%20Protocol.pdf>

<sup>21</sup> [http://en.wikipedia.org/wiki/SOAP\\_note](http://en.wikipedia.org/wiki/SOAP_note)

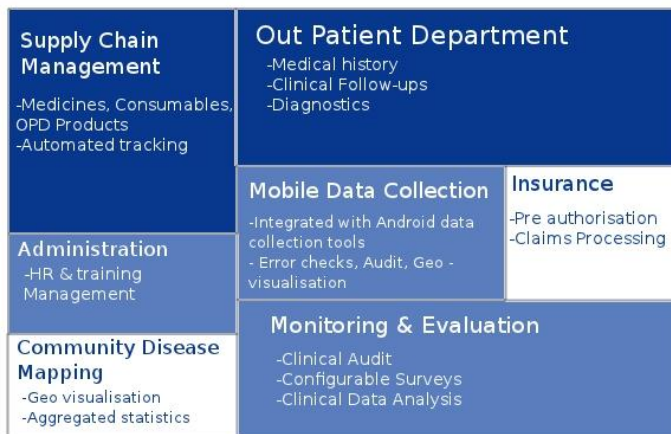
<sup>22</sup> <http://ictph.org.in/downloads/HMIS-TechnicalNote.pdf>

<sup>23</sup> <http://ictph.org.in/blog/from-the-president-zeenas-note/laying-the-primary-care-audit-guidelines-for-sughavazhvu-healthcare/>

much more feasible. Over a period of time it is expected that the HMIS will become more and more “intelligent” and will guide the physician in her work in a much more active manner and will also make the process of auditing her work much more streamlined.



### Health Management Information System



### Bridge Training Programmes

The physicians that work in the RMHC as well as the Health Extension workers (HEW) need to be trained very carefully in order to ensure that they are adequately trained to offer the full range services at the RMHC. The physicians are drawn from the AYUSH stream while the HEW is a local high school graduate. ICTPH has developed a full bridge training programme for the AYUSH physician which builds on the fact that 80% of the training provided them is identical to the one given to MBBS doctors. The HEW is trained to provide support and screening services at the RMHC.

### Conclusion

The note describes the steps taken by ICTPH to develop a model for primary care. Within the current design of public systems the RMHC in terms of location is closest to the sub-centre. Several components of the ICTPH design could go on to inform the development of a new vision for the sub-centre so that that the Public Health Centre can more effectively develop as a referral centre with the ability to handle more complex cases.