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Do toilets make a difference to health? Case study on the village of Kameshwaram

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Research performed in collaboration with Friend in Need Trust - Association Un Ami

I - Context

The Indian state of Tamil Nadu was among the regions hit by the Indian Ocean tsunami on December 26, 2004. The village of Kameshwaram, located on the eastern coast of India in the Nagapattinam district of Tamil Nadu, suffered tremendous damages and losses. As a result of the tsunami, major components of the environment were modified: the natural resources central to the livelihood of the village were altered,¹ the forest cover used by villagers for open defecation was destroyed, and the built environment was changed as intense reconstruction efforts were undertaken in the aftermath of the tsunami. Houses were built for the fishermen to replace the huts in which they lived prior to the tsunami and community centers were constructed, but most importantly household toilets were introduced in the village. From a pre-tsunami state of zero toilets, Kameshwaram now boasts a 50% sanitation coverage, with 350 ecological toilets and 350 septic tank toilets for a population comprising about 1450 households. These changes could potentially have affected the health status of the inhabitants of Kameshwaram as they are believed to be closely linked to several underlying determinants of health. In particular, the introduction of household toilets could have a direct impact on the incidence of sanitation-related pathologies in the village.

Given the above context, the purpose of this research project is to examine whether the increase in sanitation coverage in the village has had any impact on the health status of its citizens or if other health determinants are more at play. Up to now, healthcare workers have not reported a significant evolution in the health status of the villagers in the post-tsunami period. There has only been a slight change in pathologies reported during consultations at the local hospital; healthcare workers have witnessed an increase in allergenic symptoms since the tsunami. Can this be taken as an indication that the increased sanitation coverage has had no or, at best a marginal, impact on the health of villagers? This question serves as the guiding thread of the research project.

¹ The inhabitants of Kameshwaram identified two productive sectors which they believe have been affected by the tsunami. Since the tsunami, the fishermen noticed that they are frequently forced to remain at port because the marine conditions are too severe. The sea is agitated (choppy waves...) thus preventing them from using their catamarans and consequentially resulting in a lower daily catch. They have also noticed that fish migrated closer to the coasts of Sri Lanka and away from their fishing perimeter. Furthermore, the fishing sector is progressively losing out to more competitive foreigners. Secondly, the increased salinity of the soil has lowered the yield of Kameshwaram fields and consequentially the productivity of the agricultural sector.

II – Background

In conjunction with the “One Million Sanitation Systems” FINISH program, an Indo-Dutch collaboration, Friend-in-Need Trust (FIN) or Association Un-Ami² is undertaking a major research project to determine the underlying health determinants of the people of Kameshwaram, a typical coastal village that was subject to both the environmental impacts of the tsunami and the reconstruction efforts that followed. The results are to be representative of similar coastal villages in the region.

The research aims to establish the determinants of the health status at three different demographic levels: population, households and individuals. It is taken as a premise that determinants of health can be classified in four different categories: (1) environmental, (2) behavioral, (3) resources, (4) societal stress. In particular, the research seeks to qualify and quantify the impact of sanitation improvements – more specifically, of access to a toilet as one of the determinants included in the resources category – on health.

Since the health status of the population could differ according to different segments of the population, the population of Kameshwaram has been divided into two groups: (1) school students and (2) others. The latter is then sub-divided into three groups, all of which are included in the study: (2.1) working men, (2.2) women that stay at home, (2.3) and the elderly that are no longer professionally active.

III - Research question

The central research questions on the two population groups are as follows:

- By what diseases are the villagers in Kameshwaram burdened?
- What are the determinants of diarrheal diseases in the population of students of Kameshwaram? In particular, is the presence or absence of toilets one of these determinants?

The investigation will involve two steps: 1) an indexation and classification of the diseases medically diagnosed in the population of Kameshwaram within a given period of time 2) a field investigation of the determinants of these diseases in the case of students at Kameshwaram.

Step 1: During two weeks, data will be collected on every patient that has a consultation at the hospital in Kameshwaram in order to identify the major diseases present in the village in the two population groups.

Step 2: The field investigation will then focus on the health status of the student population group in order to associate the pathologies with their determinants in the case of Kameshwaram students. More particularly, the 10th grade students of the Kameshwaram San Sebastian School will be the targeted population. Each of the 150 students in the 10th grade will be interviewed to gather data on their health status and their underlying determinants.

² Friend-in-Need Trust (FIN), also called Association Un-Ami in France, was created in the aftermath of the Indian Ocean tsunami of December 26, 2004, as part of a Franco-Indian reconstruction project, by Dr. Shyama V. Ramani. The association seeks to facilitate the development and adoption of innovations in the form of new technology, new structures, new management routines and new social norms, to attain environmental and socio-economic security in the rural villages and urban slums of India. The main focus is on sanitation, i.e. individual household toilets, public toilets and solid waste management. The association is supported by donations. (<http://friend-in-need.org/index.htm>)

IV - Motivation

Scientific motivation:

Through a search in Google scholar, it was determined that there are very few academic articles on the determinants that underlie the health status of students in south-eastern coastal India. While there is information on the effect of the nutritive intake (included in the resources category) on the health status, there are no data on the other three categories of determinants.

Other motivation:

The lack of data and consequentially of evidence-based knowledge on both the disease burdens and their determinants in the village of Kameshwaram demands important health-related data collection and analysis that will describe the status of this population.

The absence of population-targeted data in the area of health prevents the development of a systematic approach to tackle the major diseases that could be used by the healthcare workers. This dearth of data also limits the efficiency of interventions aimed at favoring the development of this village that have grown as a part of the reconstruction efforts. Without information on the health status and its determinants, interventions cannot be tailored to the actual needs of the population or to the exact source of a health problem. In general, this absence or insufficiency of data impedes long term development efforts in the area of public health.

V - Methodology

Prior to departure:

In preparation for Step 1: An internet search will be conducted to identify all previous studies undertaken on the health status and its underlying determinants in coastal villages of India that were affected by the tsunami

In preparation for Step 2:

- 1) A literature review will be undertaken to establish an exhaustive list of all the determinants for diarrheal diseases as identified by previous studies. These risk factors will then be organized and linked to one another on the basis of their demographic level of impact (population, households, or individuals) and their category (environmental, behavioral, resources, societal stress) in order to create a conceptual framework mapping out all risk factors linked to those health outcomes.
- 2) A questionnaire to be used to collect data (on the pathologies and their determinants) from the students will be formulated, making sure that all questions gather data on one of the determinants in the conceptual framework. The questionnaire will be translated into Tamil and tested for cultural competency (Dr. Ryaz).

Aditi and Timothée will be introduced to the members of the Friend-in-Need Trust (FIN) or Association Un-Ami through a biographical essay that highlights their motivations for undertaking this research project.

On-site in Kameshwaram:

Step 1: During the first two weeks, data will be collected by recording background information (sex, age, occupation, presence/absence of a toilet) and the clinical diagnoses by the healthcare worker for each patient and consultation in the Kameshwaram hospital.

Step 2: Data will be collected through a questionnaire that seeks to gather information on the health status of the students of Kameshwaram. The questionnaire will contain questions that determine what are the different symptoms and pathologies experienced by the students. In addition, several questions will be aimed at collecting data on all the determinants included in the conceptual framework.

The questionnaire will be administered by Aditi and Timothée to each of the 10th grade students (n=150) at San Sebastian (the local high school). The interviews will be constructed as a supplement to the students' English lessons. Furthermore, in exchange for their participation, the students will be given an English-to-Tamil translation dictionary.

If there is additional time: in order to clarify the determinants and to quantify the extent of the problem, the findings on Kameshwaram will be compared with similar data on other surrounding villages. This will determine whether the public health problems identified are specific to Kameshwaram or inherent to a broader geographic area.

The presence of certain diseases commonly observed in developing settings similar to the coastal region of Tamil Nadu and their causes will be taken as a priori knowledge. This research hypothesizes that similar disease burdens will be found, to the exception of certain diseases that could be specific to tsunami-affected regions. The research question is aimed at verifying this hypothesis and identifying the determinants of these burdens.

VI – Impact and Dissemination

1. Three seminars will be conducted to present the results to different audiences:
 - a. The administrators of the school
 - b. Dr. Riyaz and Dr. Manimekalai
 - c. The Kameshwaram hospital
2. The report will be posted on the website of Friend-in-Need Trust (FIN) or Association Un-Ami (www.friend-in-need.org).
3. The data collected and analyzed to answer the research questions can be directly applied to projects aiming to remedy the causes behind the disease burdens. As a consequence, propositions for future interventions to be put in place by local NGOs and other actors will be included in the discussion of the research.
4. Recommendations will be made to the school in the form of a presentation and issue brief to improve the hygiene of the students based on the results.

VII - Milestones

1. Finalize the research proposal
2. Design and finalize a questionnaire
3. Conduct interviews
4. Analyze data
5. Draft a first version of the discussion of the results
6. Present the results and analysis
7. Revise the results and analysis
8. Produce a final draft of the research findings and analysis

VIII – Tentative timeline

<i>February 1 - May 15:</i>	Finalization of the research proposal Realization of the literature review and construction of the conceptual framework Creation of the questionnaire
<i>May 15 - June 7:</i>	Testing of the questionnaire in Bangalore by Aditi
<i>June 4 - June 15:</i>	Discussion with doctors in Bhopal to identify <ul style="list-style-type: none"> - the disease burdens of coastal villages in south-eastern India pre- and post-tsunami - the health effects of environmental modifications and reconstruction efforts in tsunami affected areas - the perceived determinants of the disease burdens in these villages
<i>June 15 – July 1:</i>	Data collection in Kameshwaram hospital
<i>July 1 – July 15:</i>	Conduction of the interviews in Kameshwaram
<i>July 15 – August 1:</i>	Production of the report (analysis and discussion of data) & carrying out any further research needed in Kameshwaram
<i>August 1 – August 15:</i>	Finalization of the report in Delhi
<i>August 15 - August 19:</i>	Presentation of the results and analysis
<i>August 19:</i>	Timothée departs from India