Service Availability Mapping (SAM)

(A pilot project on Nilphamari district in Bangladesh)

Government of the People's Republic of Bangladesh

Ministry of Health & Family Welfare

Management Information System (MIS)

Directorate General of Health Services (DGHS)

Mohakhali, Dhaka-1212

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Web: www.dghs.gov.bd

In collaboration with

World Health Organization, Bangladesh

October, 2009

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World Health Organization
Bangladesh

November 2009

Message

Secretary
Ministry of Health & Family Welfare
Government of the People's Republic of Bangladesh

I am very pleased to know that the Management Information System (MIS) of DGHS has successfully completed the first pilot on Service Availability Mapping (SAM) and is going to publish a report on this pilot. SAM is a relatively new tool which is rapidly gaining popularity due to its inherent property of simplicity for presenting service data in geographic locations. The development of Global Positioning System (GPS) has made possible to capture exact geographic position of any event, structure or service and to position this location in map. Geographic distribution of disease outbreaks, population with specific characteristics, health facilities or health services can be captured through GPS and pointed in administrative maps through computer software for dynamic display interactively or printing in hard copy. These visual images help policy makers to easily understand nature or distribution of diseases, population, facilities and services to judge length or depth of problem, rationality, need or demand. This in turn helps quicker but correct planning, implementation and measurement of outcomes.

The first successful pilot on SAM done by MIS-health is also a step forward towards Digital Bangladesh. The Ministry of Health & Family Welfare has already acquired an impressive progress in implementation of Digital Bangladesh. The notable of which is expansion of Internet backbone up to upaziIa hospitals. It is an exemplary development even in the South-East Asia. I appreciate the bold steps of MIS-health for making such a unique contribution to our health sector. I believe that successful completion of first SAM project by MIS-health will also be regarded as another milestone. While I hail MIS-health for this achievement, I also acknowledge WHO Country Office Bangladesh for providing technical assistance for this project under biennium 2008-2009.

Shaikh Altaf Ali

Message

WHO Representative to Bangladesh

I am very glad to know that Management Information System (MIS), Directorate General of Health Services has piloted Service Availability Mapping (SAM) in Nilphamari district of Bangladesh as a collaborative effort of the Ministry of Health and Family Welfare and WHO Bangladesh.

The main focus of this effort is to enable district health administration to map health services provided in their areas and monitor the performance of the services. The benefits of SAM are its simple data collection procedure and 'user-friendly' presentation of data. Maps and tables generated through SAM provide a clear understanding about availability and distribution of services with identification of existing gaps in the provision of health services and interventions.

I feel further piloting is required to acquire and improve capacity of the GOB before rolling-out the pilot through out Bangladesh. Availability of SAM for decision-making at all levels of Bangladesh will be a very efficient and effective way to map and monitor health service and resource availability on a regular basis.

I wish all success on introducing SAM application of public health mapping in Bangladesh.

Dr Duangvadee Sungkhobol

World Health Organization
Country Office for Bangladesh

Message

Director
Management Information System
Directorate General of Health Services
Government of the People's Republic of Bangladesh

This report is on our first pilot on SAM. SAM, as we know, stands for Service Availability Mapping. It uses the Geographic Information System (GIS) to locate presence of specific services, which the survey or research team members wish to display in maps. We, at MIS-health, feel that SAM can be an appropriate tool for Bangladesh to understand the distribution of health facilities and health services. We can not claim that in the past when our health facilities were created, all of them were created on the basis of absolute judgment. SAM can help us to quickly understand, how they are spread over the country. SAM can help us to quickly visualize the existing presence of health services and whether they are matched with need. The data collection technology is relatively straight forward and can be deployed by even with low-skilled staffs. Our first pilot demonstrates that we can grab this new technology through our district health offices.

I am happy to be able to complete the first pilot and publish this report. I extend my heartfelt thanks to WHO Country Office in Bangladesh to provide technical assistance for this unique project. I also express my deep acknowledgement to the Ministry of Health & Family Welfare to support our initiatives to introduce new technology. Finally, I acknowledge Md. Nezam Uddin Biswas of our MIS-health team to undertake the technical burden with regard to this wonderful technology. Dr Mizanur Rahman, Ex-Chief, Health Information Unit of MIS-health led the data collection team. The civil surgeon of Nilphamari district and all of Upazila Health & Family Planning Officers including the local MIS-health staffs were very cordial and kind to actively cooperate in the exercise. I wish all of them the best achievements in their life.

Professor Dr Abul Kalam Azad

Credits

Acknowledgement
Professor Dr AFM Ruhal Haque, MP, Honorable Minister for Health & Family Welfare
Professor Dr Syed Modasser Ali, Honorable Adviser to the Prime Minister for Health & Family Welfare
Dr. Captain (Retd.) Mozibur Rahman Fakir, MP, Honorable State Minister for Health & Family Welfare
Mr. Shaikh Altaf Ali, Secretary, Ministry of Health & Family Welfare
Professor Dr Shah Monir Hossain, Director General of Health Services
Dr. Duangvadee Sungkhobol, WHO Representative to Bangladesh
Dr. Ranjit Kumar Dey, National Professional Officer, WHO, Bangladesh

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Coeditor of the Report
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Dr. Nasreen Khan, Medical Officer, MIS, DGHS

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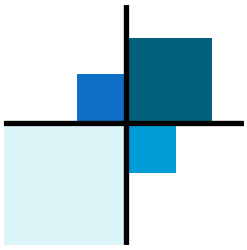
Md. Nezam Uddin Biswas, GIS Consultant
Md. Emdadul Hoque, Statistical Assistant
Md. Shahnawaz Miah, Office Assistant

Civil Surgeon Office, Nilphamari
Dr. Anwarul Islam, Civil Surgeon
Md. Mahbub Rabbani, Statistical Assistant, Civil Surgeon Office

Upazila Health Offices
Nilphamari sadar
Dr. A. Mazid Sarker, Upazila Health & Family Planning Officer
Md. Mahbubur Rahman, Health Inspector
Domar
Dr. Anwarul Islam, Upazila Health & Family Planning Officer
Md. A. Matin, Health Inspector
Dimla
Dr. Din Muhammad, Upazila Health & Family Planning Officer
Md. Jahurul Islam, Health Inspector
Md. Jahurul Hoque, Statistician
Jaldhaka
Dr. Md. Sawkat Ali, Upazila Health & Family Planning Officer
Azay Kumar Roy, Health Inspector
Kishoreganj
Dr. Md. A. Kader Khan, Upazila Health & Family Planning Officer
Saidpur
Dr. Md. Nazibur Rahman, Upazila Health & Family Planning Officer
Md. Nazrul Islam, Health Inspector



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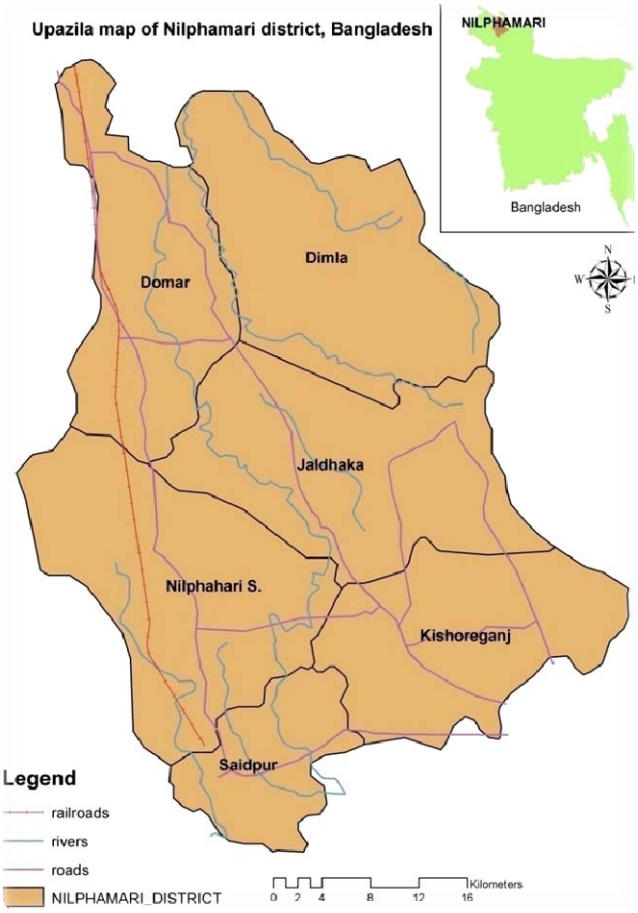
Introduction

Service Availability Mapping for Health was piloted in Nilphamari district of Bangladesh as first case of such "Geographic Information System (GIS)" based project of MIS-Health, DGHS. The project was carried out with technical assistance of WHO under biennium 2008-2009. Nilphamari was chosen purposively because of three reasons: (a) extreme location in one end of the country; (b) plain land with good road communication system across all upazilas and unions possible to travel quickly with motor bikes; and (c) enthusiastic team of health managers in district and upazilas.



Nilphamari was a sub-division of Rangpur District until 1984, when it was upgraded to district. Nilphamari sub-division was established in 1875 during the British era. Currently, the district consists of 6 upazilas, 3 municipalities, 33 wards, 65 mahallas, 62 union parishads, 390 mouzas and 370 villages. The upazilas are Nilphamari Sadar, Dimla, Domar,

Profile of Nilphamari District	
Upazila:	6
Municipality:	3
Union:	62
Ward:	33
Mahalla:	65
Mouza:	390
Village:	370
Land area (sq. km.):	1640.91
Population:	1,856,850 (GR 2009)

Source: wikipedia

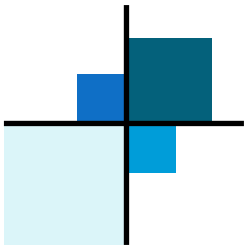
Jaldhaka, Kishoreganj and Saidpur with a total land area of about 1640.91 square kilometers. The 2009 projected population based on the Geographical Reconnaissance (GR) is estimated at 1,856,850.

What is Service Availability Mapping (SAM)?

The Service Availability Mapping (SAM) is an application of public health mapping that aims to rapidly assess and monitor the availability and coverage of health infrastructures, human resources and services provided within specific geographic or administrative boundaries. It is a decision-making tool. It helps to undertake comprehensive health facility census. On the other hand, it is a rapid assessment tool focused on determining the availability of key programs and resources across facilities.

The district service availability mapping enables the district health management to map health services provided in the catchment area and monitor the performances. The benefits of SAM, however, are its systematic data collection procedure and 'user-friendly' presentation of data. Maps and summary measures generated through SAM provide a complete picture of the level and distribution of district resources, as well as highlight gaps in the provision of health services and interventions.

Issues related to access, coverage and utilization can be addressed only if service availability is first known. Several health measurement tools provide information on access, coverage, use and quality of services. These include hospital-based statistics and facility surveys. However, none of them is as low-cost and as rapid method as SAM is.



Objective

To pilot application of SAM in the context of Bangladesh through the existing health staffs of the Directorate General of Health Services or of the Ministry of Health and Family Welfare.

Method

Our SAM tool was made up of two components:

1. Questionnaires: To collect demographic information of the district population and also of the health facilities.
2. Mapping Interfaces: Hardware (PDA and GPS) and software (Health Mapper and Geographical Information System).

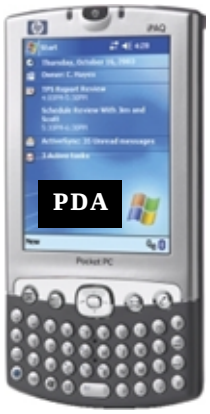
Training

The Management Information System (MIS), DGHS organized a training workshop in collaboration with the World Health Organization on the implementation of Service Availability Mapping (SAM). Held in September 2009 the training workshop was participated by concerned personnel and staffs assigned for carrying out the SAM. The practical issues of SAM, such as, capturing spatial locations on PDA, labeling them, synchronizing the data onto computer and other related skills on the SAM software (HealthMapper) were emphasized. Further training was given to MIS-health staffs on the procedures of collection of basic data on the health infrastructures and services from the health facilities, both private and public.

Data collection

Standard survey questionnaire and Personal Digital Assistants (PDA) were used for data collection. Co-ordinates of the physical location of each facility were recorded using Geographic Positioning System (GPS). Finally data were transferred in personal computer to synchronize between service and population data with geographic data. Maps were drawn to show location and distribution of health infrastructures and services. Data collection was done in September 2009.

ICT for field data collection

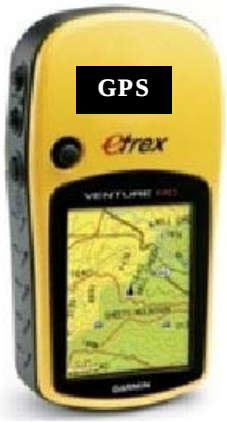


PDA

Personal Digital Assistant (PDA) made by ASUS with in-built GPS capturing capability was used as one of the choices. Then, the data were transferred to the mapping software (viz. GIS) to draw the maps.

Garmin eTrex wireless hand GPS

Another choice of data collection was Global Positioning System (GPS). Only geographical coordinates have been read in the GPS. Paper-based form data were entered into database file and then combined with GPS data.

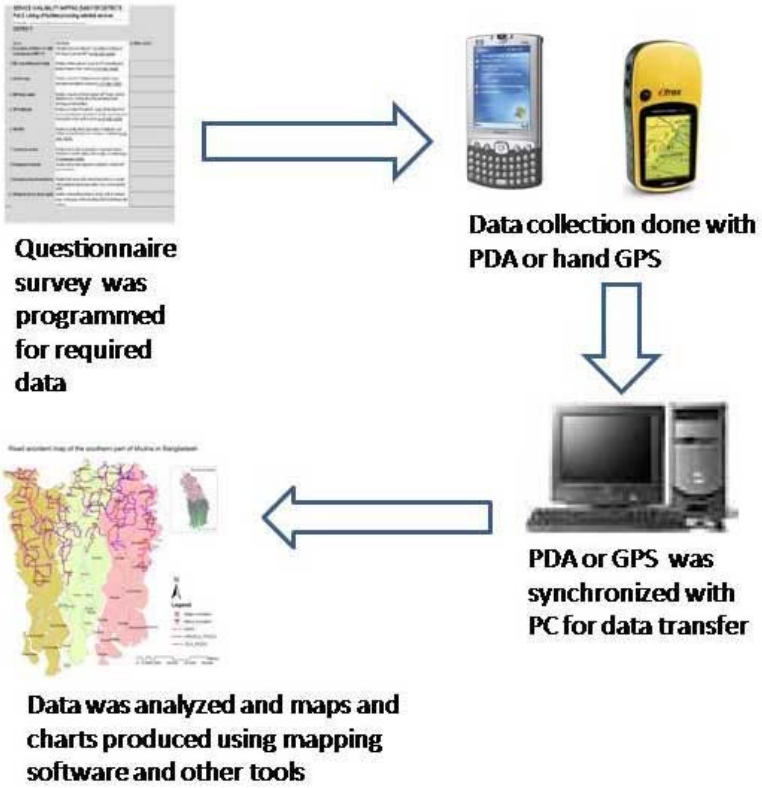


Advantages of PDA and hand GPS

Both the machines have following advantages over the conventional paper-based methods:

- Ease of form creation
- Capacity to create complex data entry forms
- Simplicity of operating environment
- Ease of data entry
- Speed of data entry
- Suitability for non-GPS data collection
- Back-up options
- Portability/weight
- Accuracy

Schematic diagram of data processing procedure in SAM

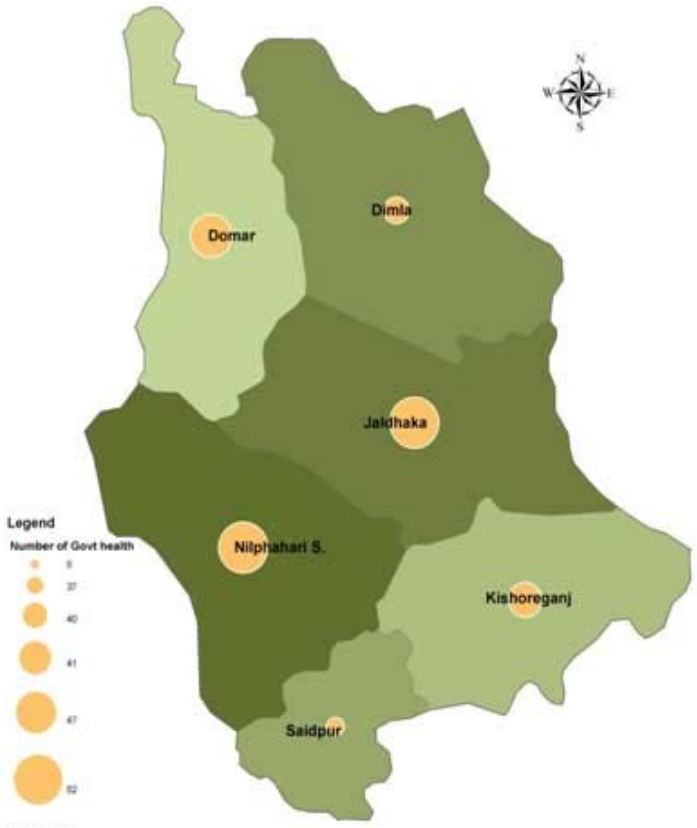


Health Facilities

Findings

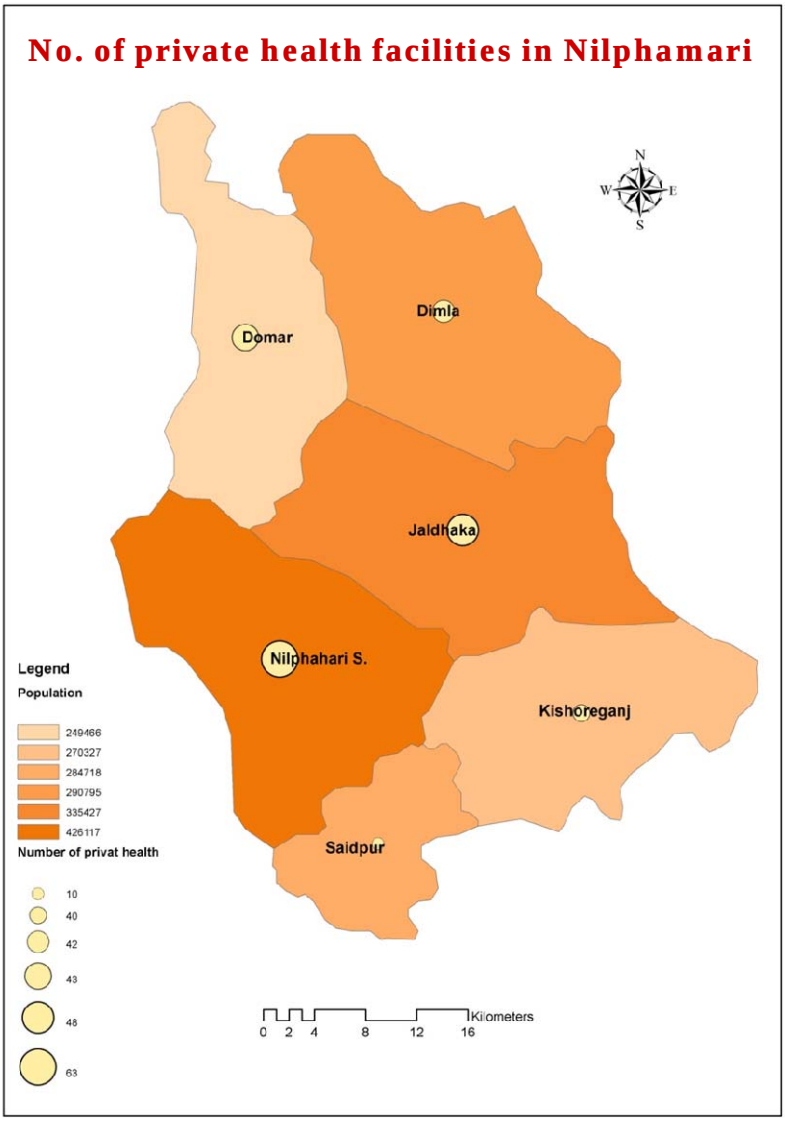
Government Health Facilities

There are 251 government health facilities in the district of which one is district hospital, 6 are upazila health complexes, 62 are health and family welfare centers, 17 are union sub-centers, 157 are community clinics and 8 are other types of health facilities.

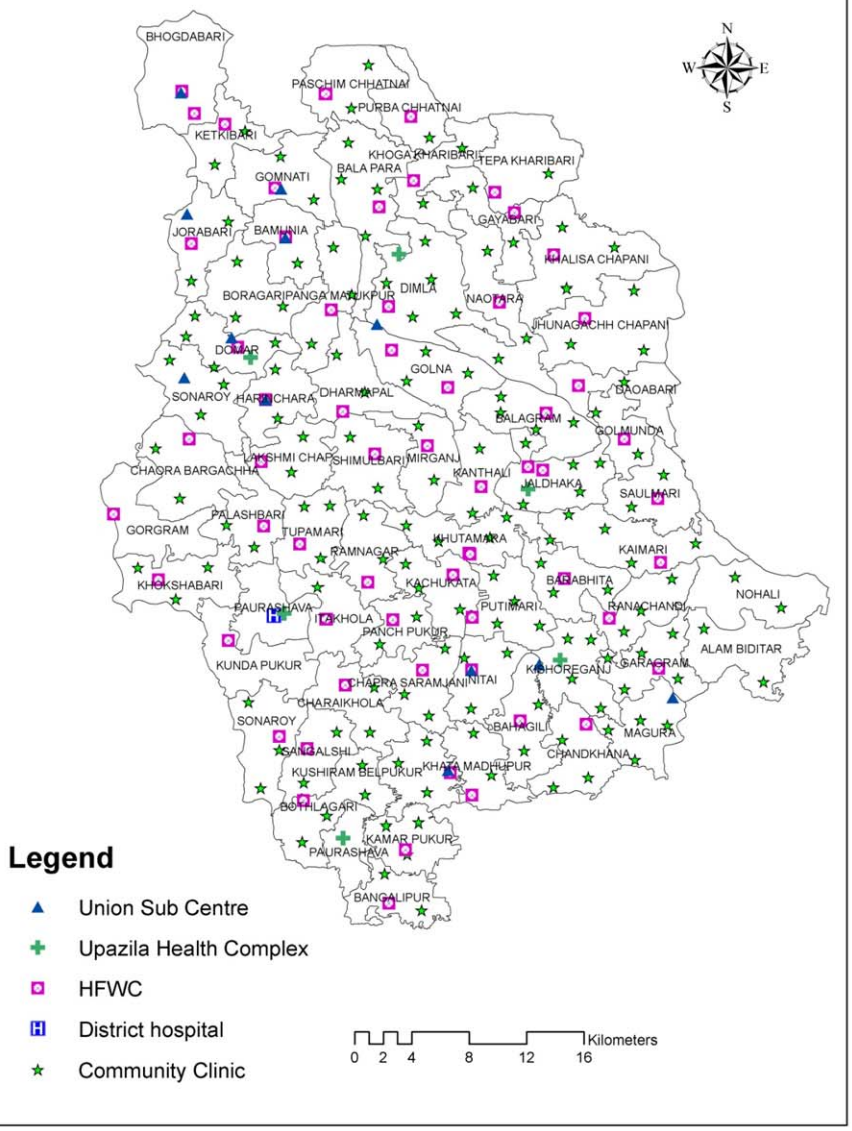


Upazila	UHC	HFWC	USC	CC	Other	Total
Dimla	1	10	1	25	0	37
Domar	1	9	5	22	4	41
Jaldhaka	1	10	4	32	0	47
Kishoreganj	1	8	3	31	3	46
Sadar	1	15	2	33	1	52
Saidpur	1	5	2	14	0	22
Total	**6**	**57**	**17**	**157**	**8**	**245**

No. of private health facilities in Nilphamari



Location of all types of government health facilities in the district 2009



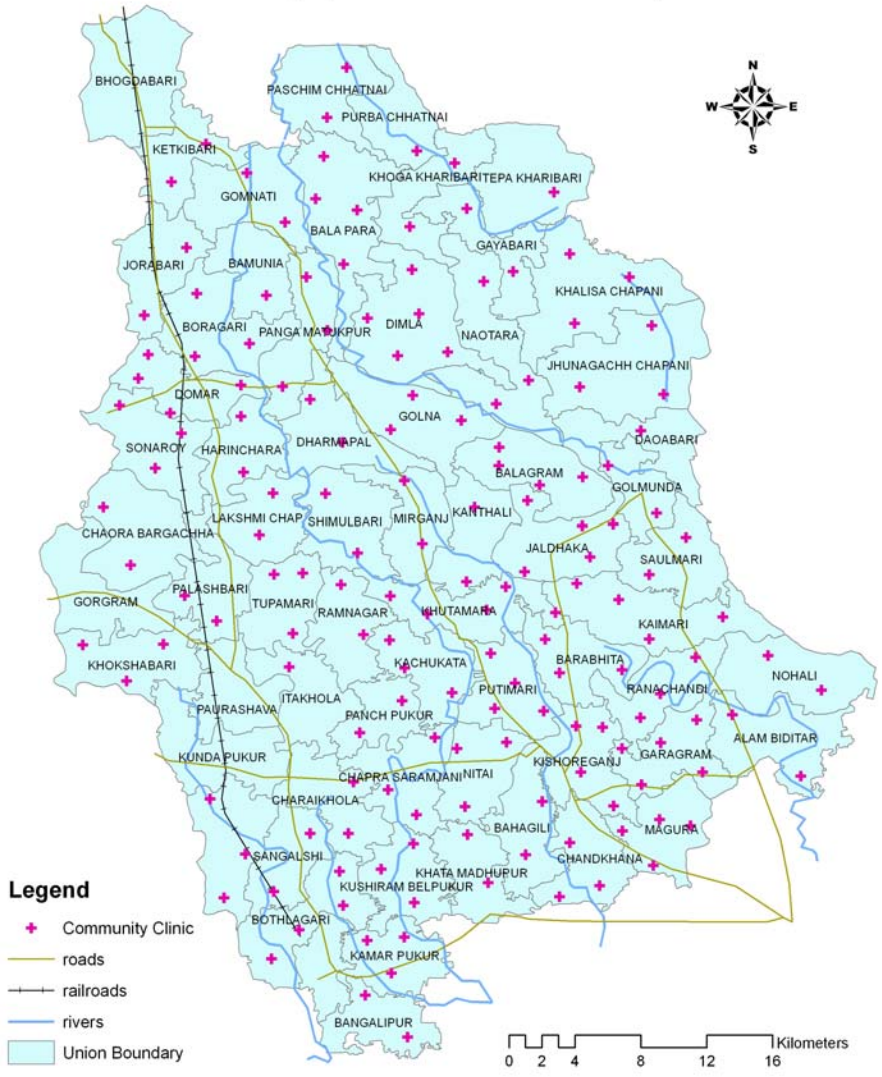
Location of District Hospital 2009

Location of Upazila Health Complexes 2009

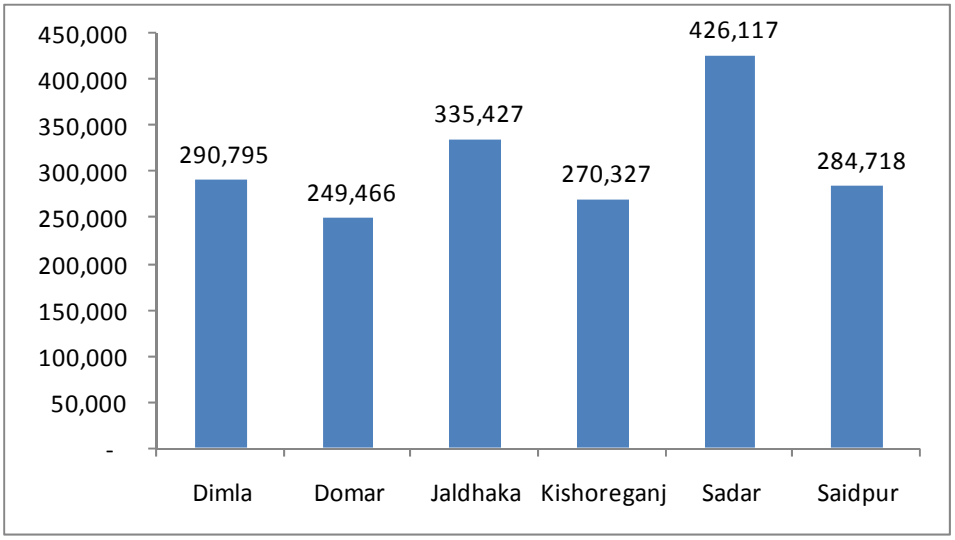
Location of Union Sub-centers 2009

Location of Health & Family Welfare Centers 2009

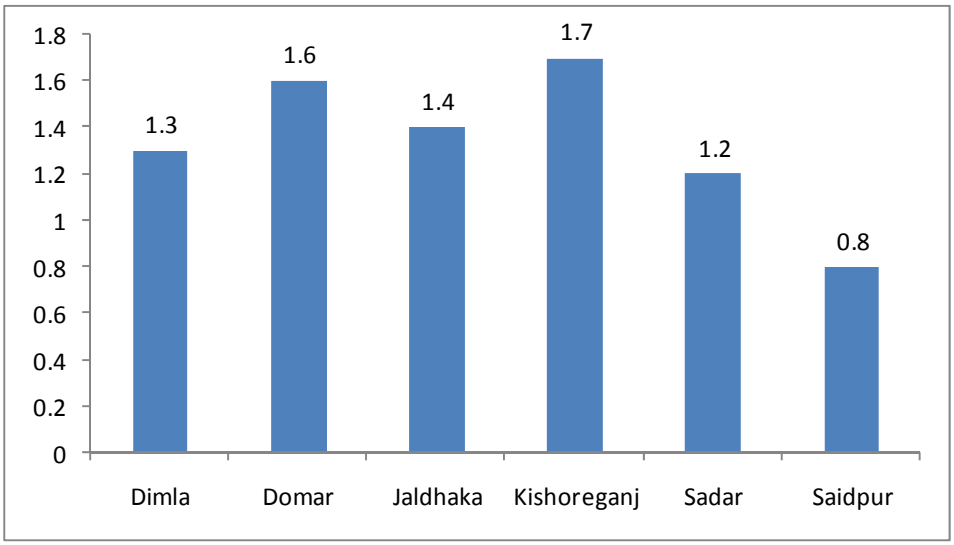
Location of Community Clinics 2009



Upazila-wise population in the district (GR 2008)

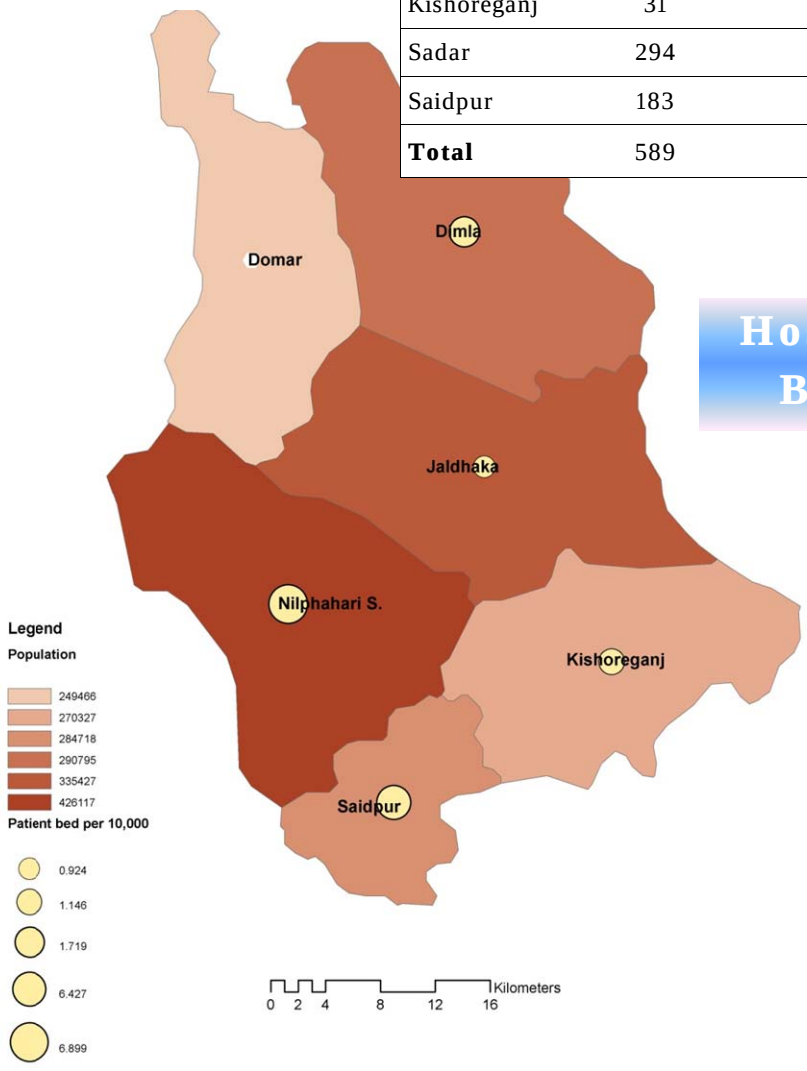


Upazila-wise number of government health facilities per 10,000 population in the district 2009



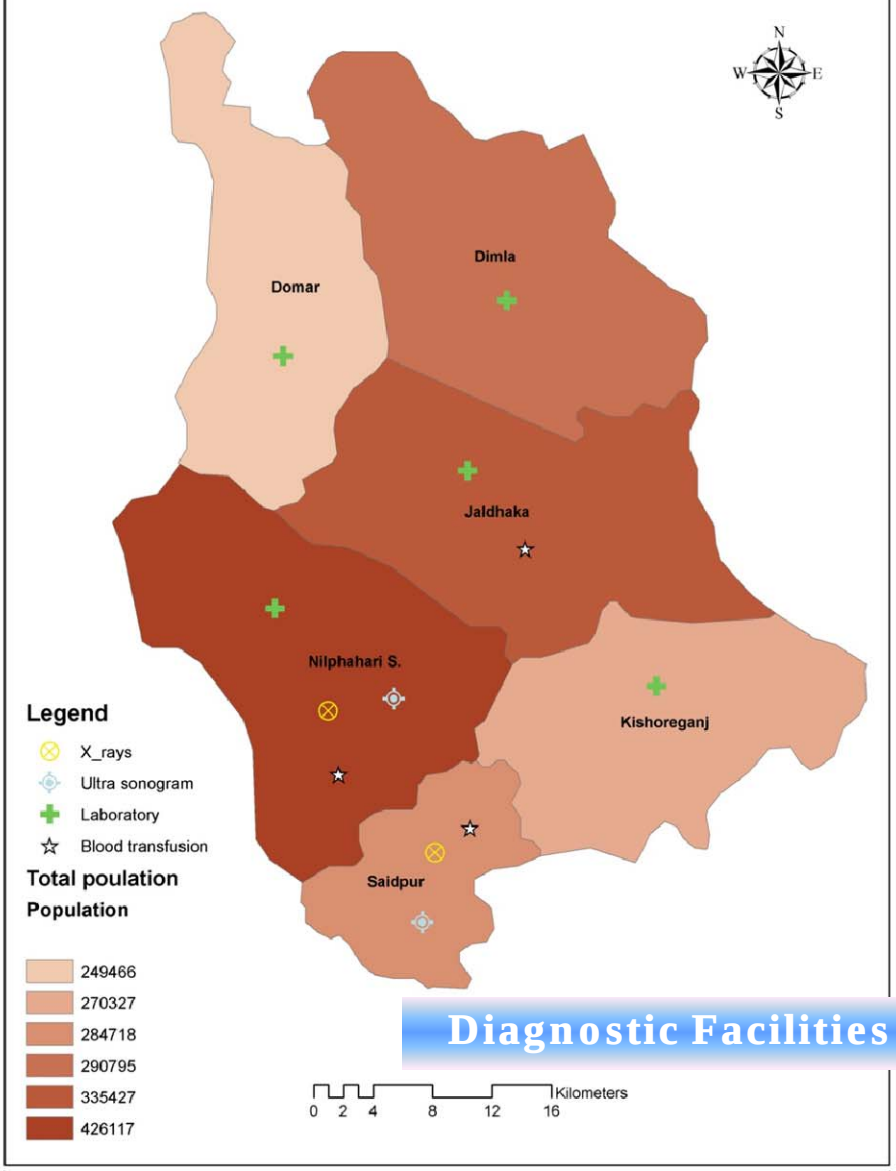
Upazila	No. of beds	Beds/10,000 population
Dimla	50	1.7
Domar	0	0.0
Jaldhaka	31	0.9
Kishoreganj	31	1.1
Sadar	294	6.9
Saidpur	183	6.4
Total	589	3.2

Hospital beds in the district 2009



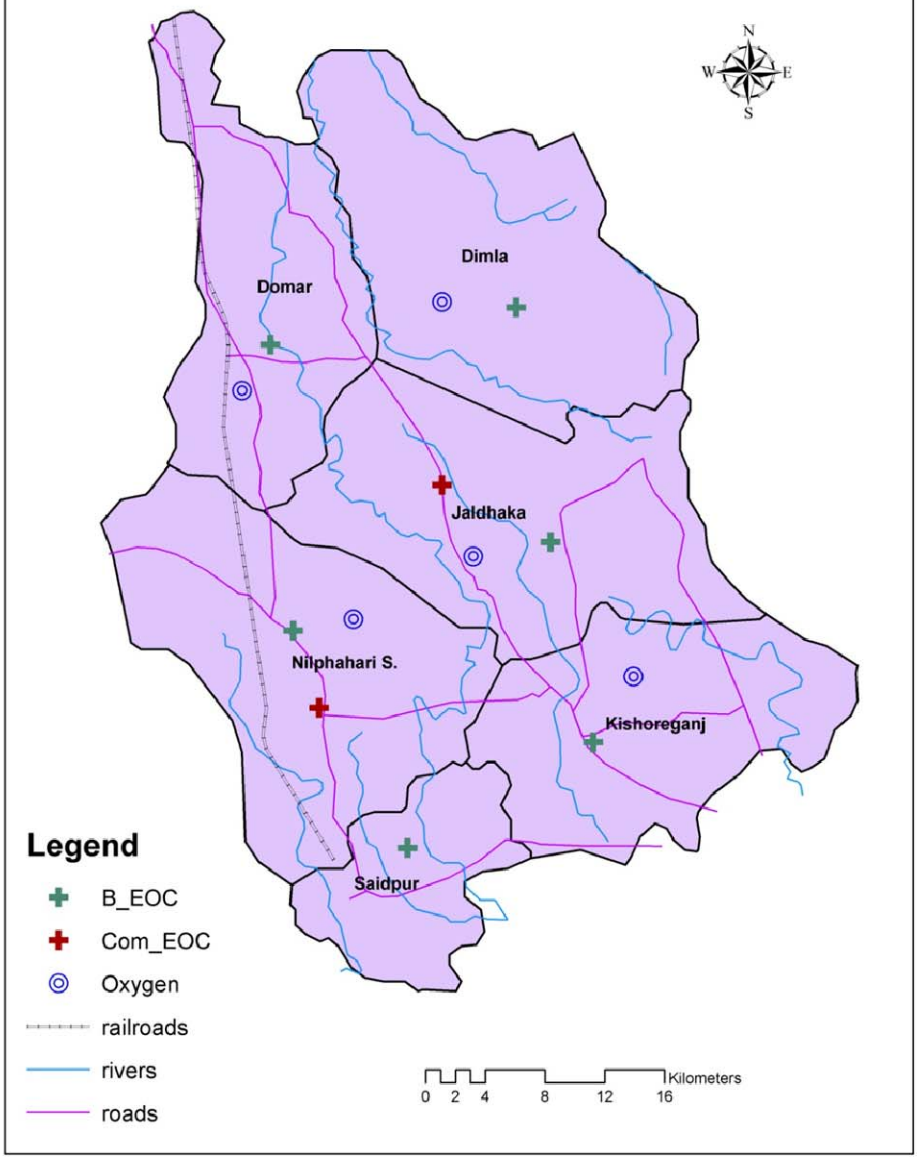
Hospital Beds

Availability of X-ray, Ultrasonogram, Laboratory and Blood Transfusion facilities in the district 2009



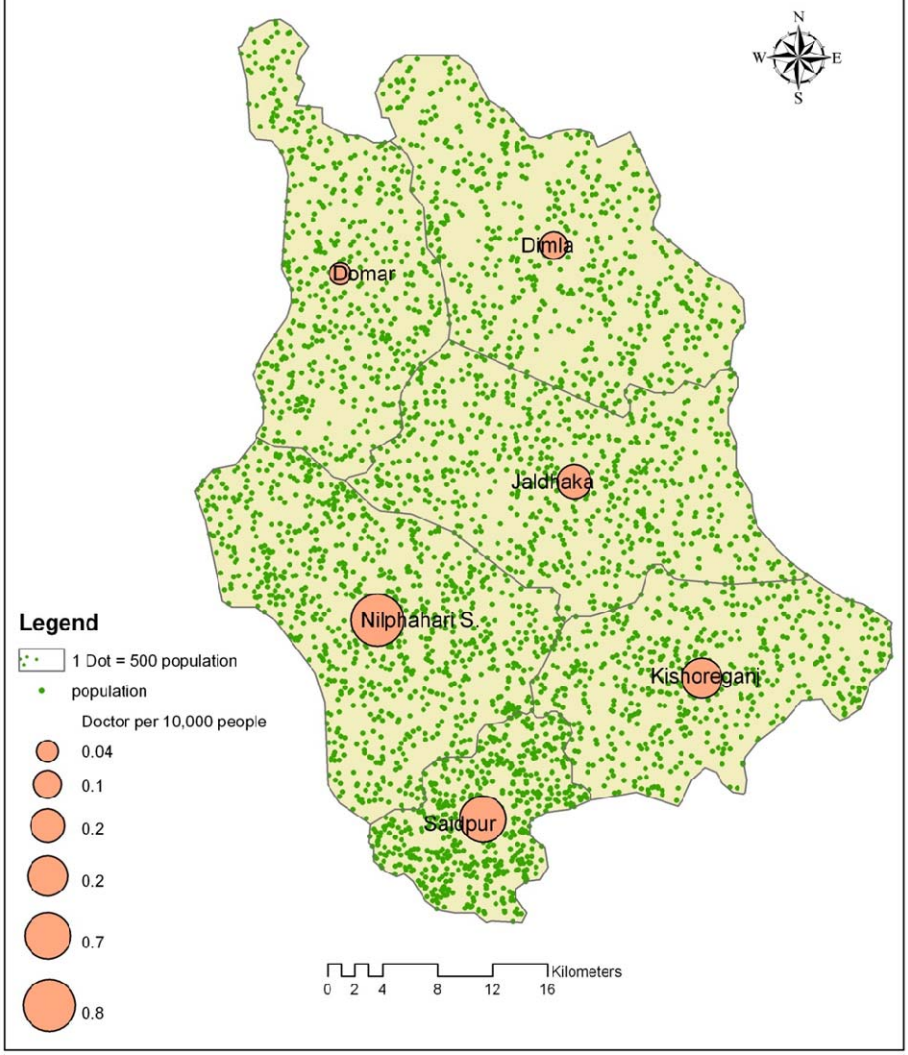
Diagnostic Facilities

Availability of basic emergency obstetric care (B_EOC), comprehensive emergency obstetric care (Com_EOC) and oxygen therapy in the district 2009

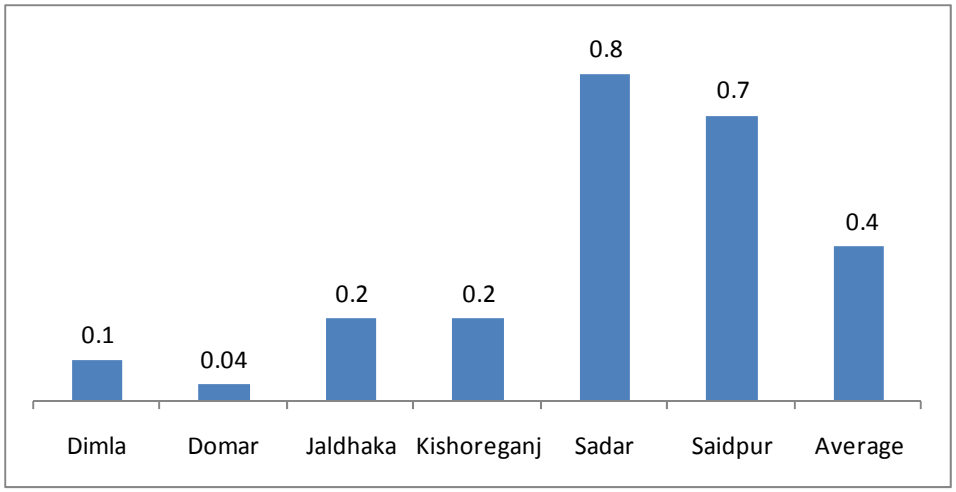


Health Manpower

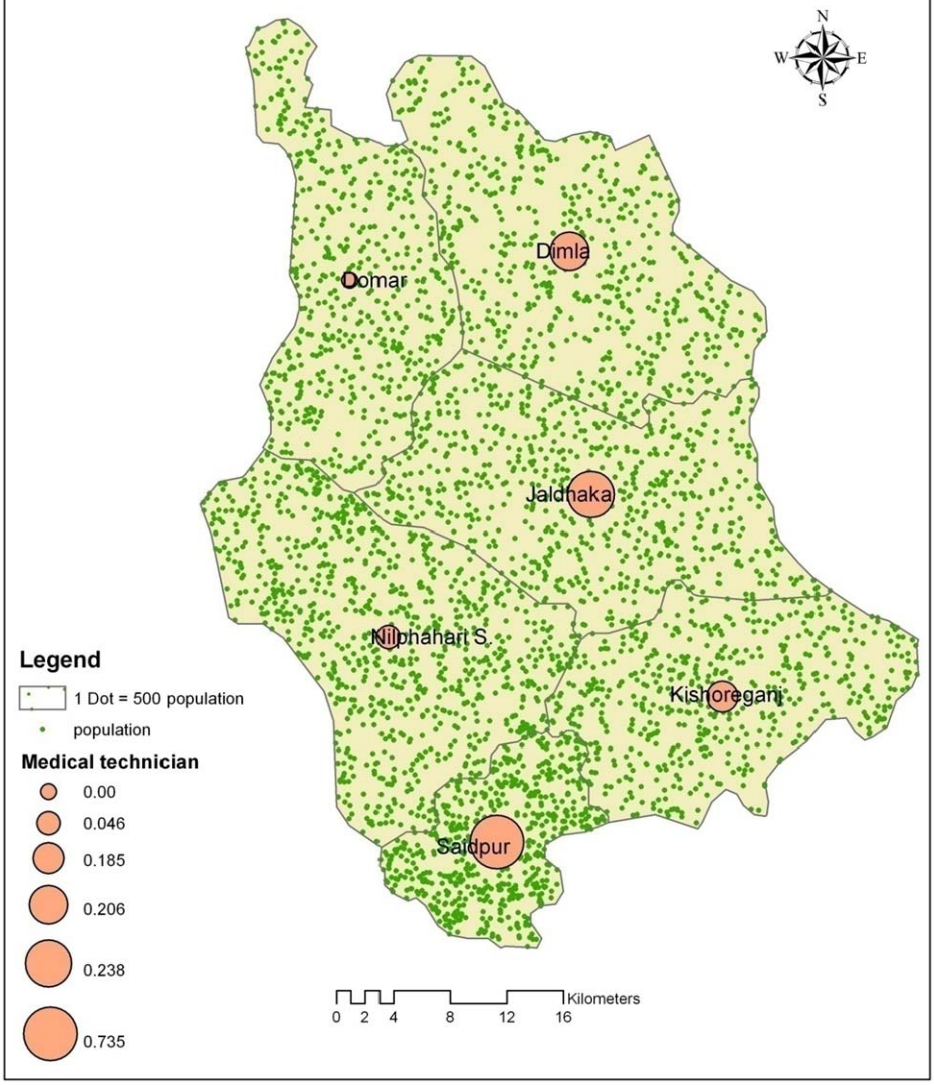
Density of doctors per 10,000 population in different upazilas of the district 2009



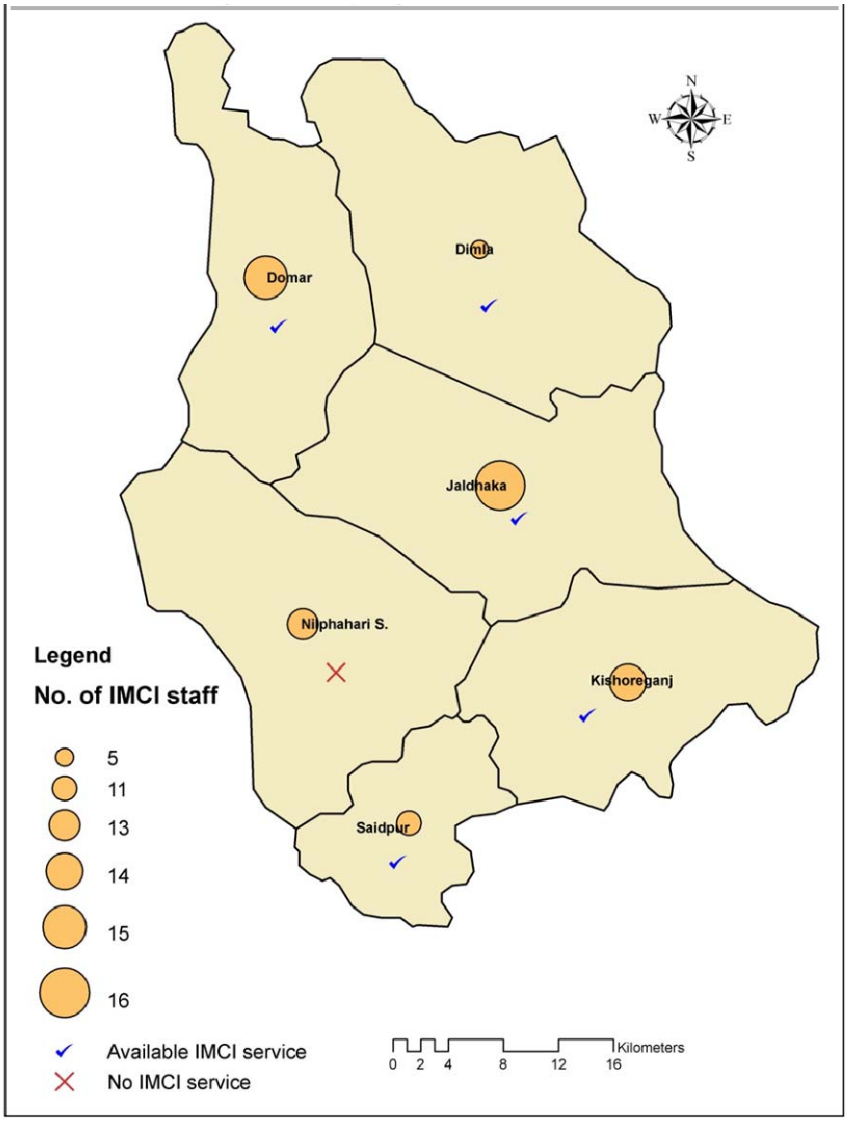
No. of doctors per 10,000 population in different upazilas of the district (Total in district = 70), 2009



Density of medical technologists per 10,000 population in different upazilas of the district (Total in district=42) 2009

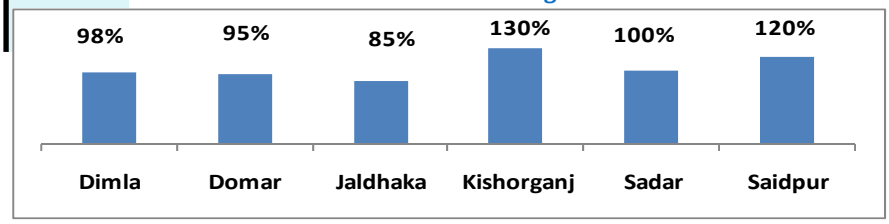


Availability of health workers trained on IMCI (Integrated Management of Childhood Illness) in different upazilas of the district

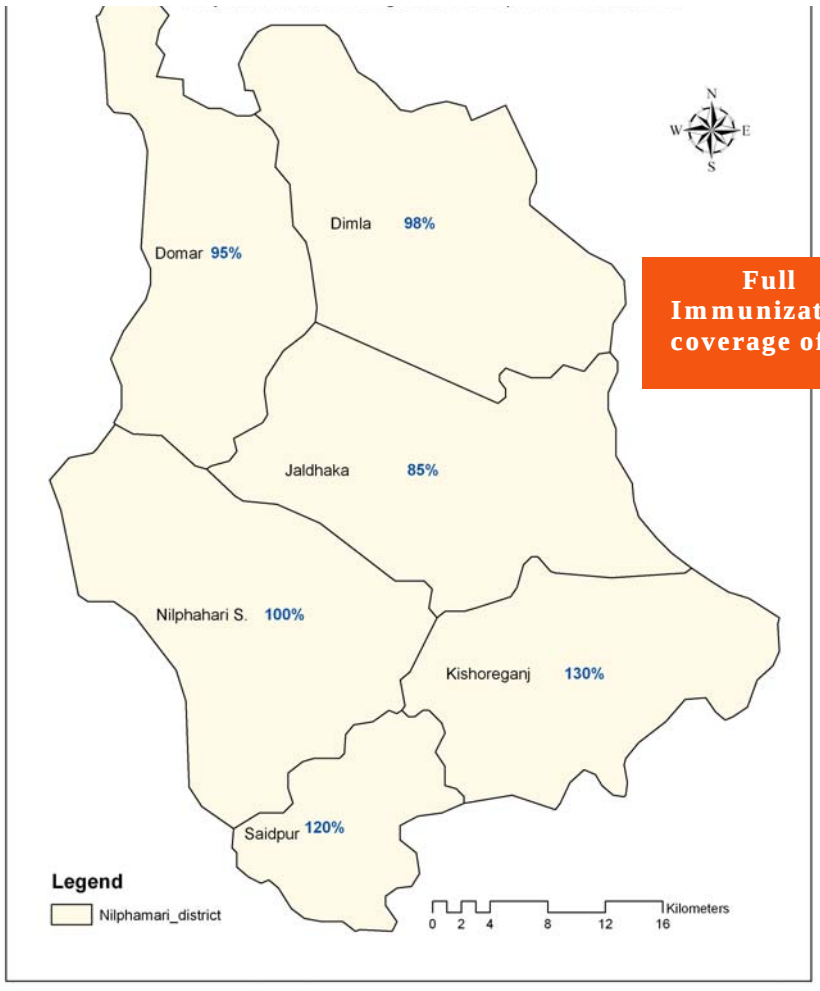


Service Availability Mapping (SAM) for Health

Full Immunization coverage of <2 children

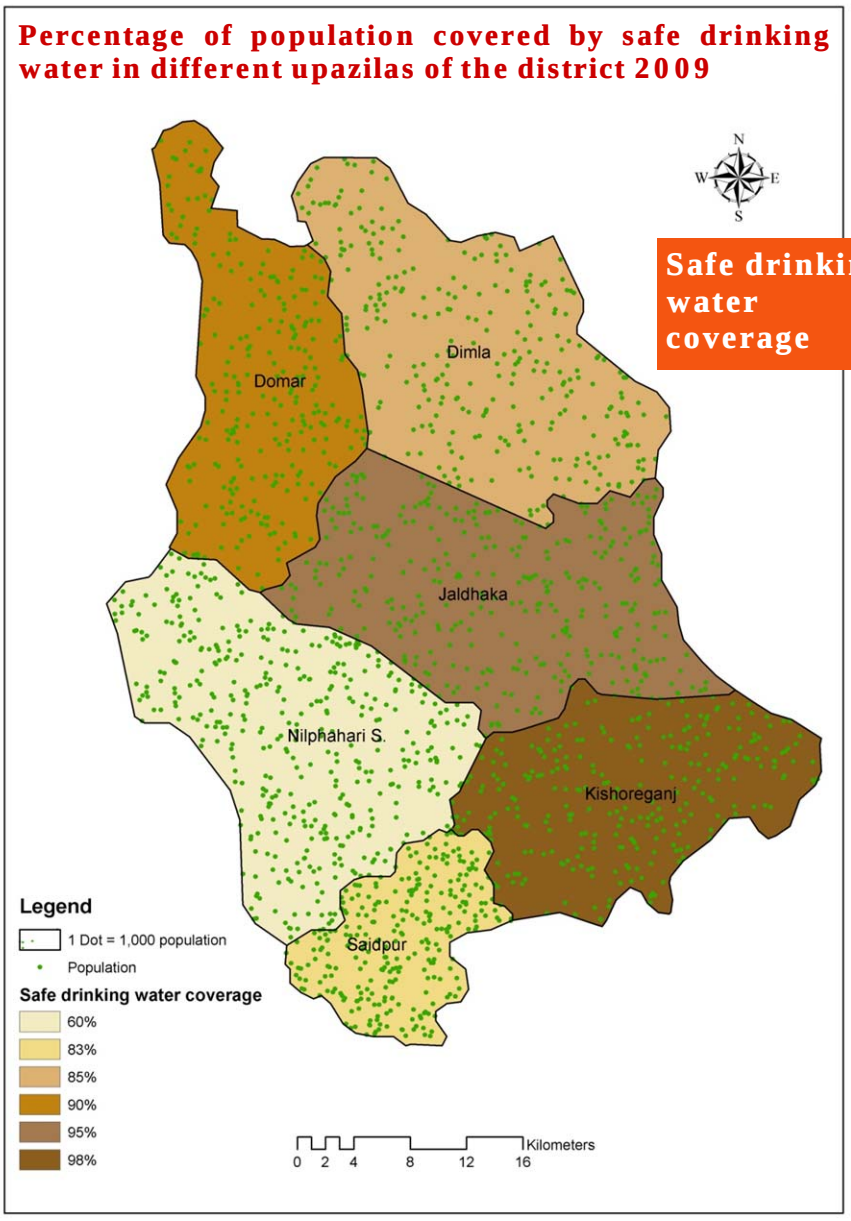


Full Immunization coverage in different upazilas of the district 2009

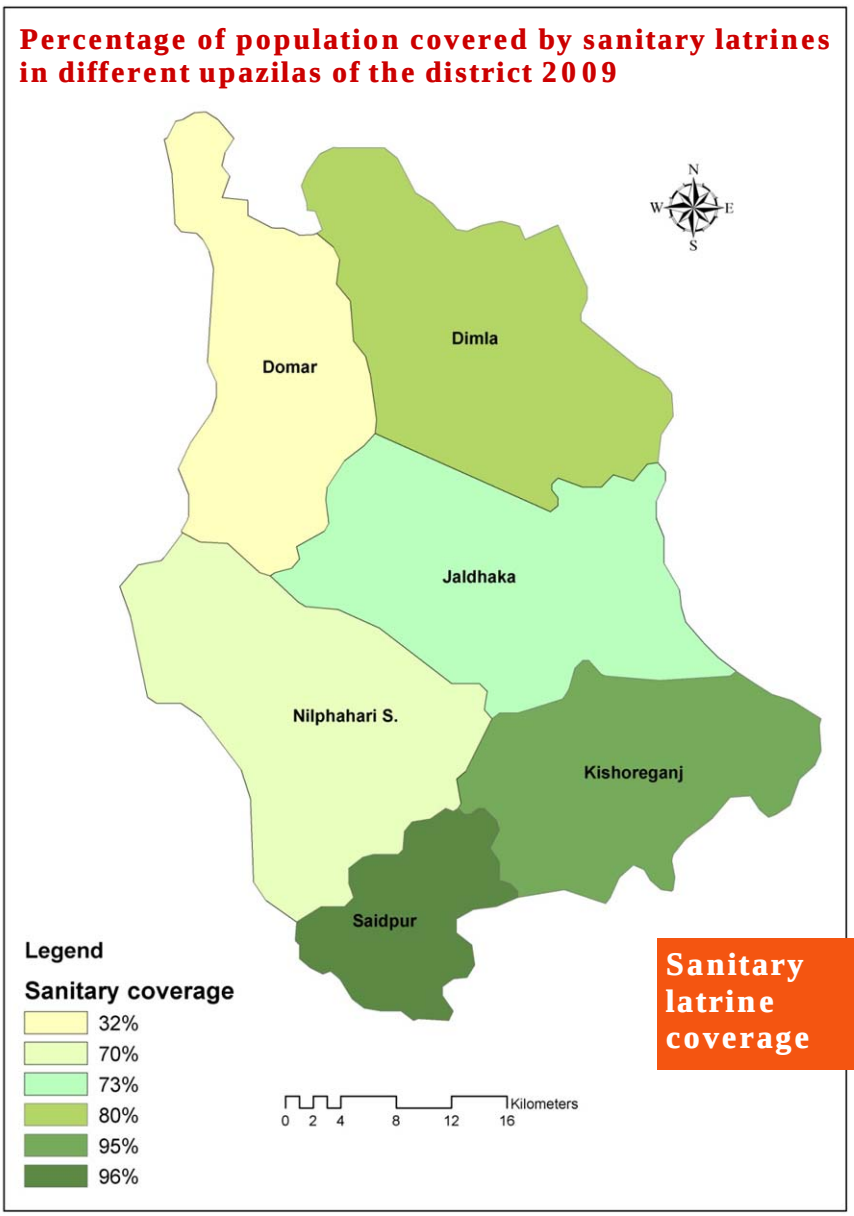


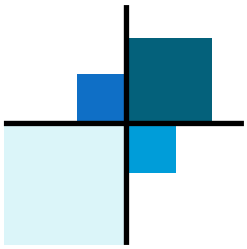
Full Immunization coverage of <2

Percentage of population covered by safe drinking water in different upazilas of the district 2009



Percentage of population covered by sanitary latrines in different upazilas of the district 2009





Conclusion

SAM can provide a snapshot of availability and location of key health interventions. Supervisory visits to health facilities if integrated with SAM can be simple enough which can add the power of visually impressive design for quick understanding. Use of HealthMapper and GIS tools, for example, involves uploading the data generated from the supervisory visits into a national monitoring system. With SAM, this is relatively easy to do and it will not increase the workload of health professionals. Our study shows that the distribution of health facilities is not even in all the upazilas of Nilphamari district. The same is also true for distribution of human resources for health. Most of the positions of doctors were vacant in Dimla and Domar upazilas during the study period.

Recommendations

- Integrate SAM into National Health Information System (NHIS).
- Build capacity of district health management to undertake SAM-based monitoring and evaluation independently.
- Streamline the uneven distribution of health facilities and manpower between different upazilas of Nilphamari district.

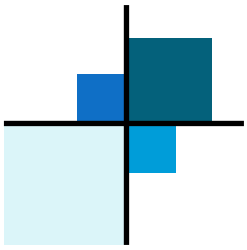
Annexure

SAM QUESTIONNAIRE

(For use with key informants)

[Please fill the information below before beginning the interview]

1. Date (dd/mm/yyyy): ...../...../.....
2. Upazila name: .....
3. Upazila population: .....
4. No. of unions: .....
5. No. of wards: .....
6. No. of villages: .....
7. No. of government health facilities: .....
8. No. of non-government health facilities: .....
9. No. of hospital beds in government facilities: .....
10. No. of upazila health complex: .....
11. No. of Union Sub-center: .....
12. No. of health & family welfare center: .....
13. No. of community clinic: .....
14. No. of medical doctors in government facilities: .....
15. No. of medical technologists in government facilities: .....
16. No. of health workers trained on IMCI: .....
17. Does following service exist?



X-ray	Y	N
Oxygen therapy	Y	N
Blood transfusion service:	Y	N
Laboratory service:	Y	N
Ultrasonogram:	Y	N
Basic emergency obstetric care (B_EMOC):	Y	N
Comprehensive emergency obstetric care (C_EMOC):	Y	N
Integrated Management of Childhood Illness service (IMCI):	Y	N

18. Immunization coverage of under 2 children: ..... %
19. Coverage of population with safe drinking water: ..... %
20. Coverage of population with sanitary latrine: .....%

Name of respondent: .....

Designation: .....