IMMUNIZATION DATA ANALYTICS FOR SUSTAINABLE DEVELOPMENT

GRAND CHALLENGES INDIA

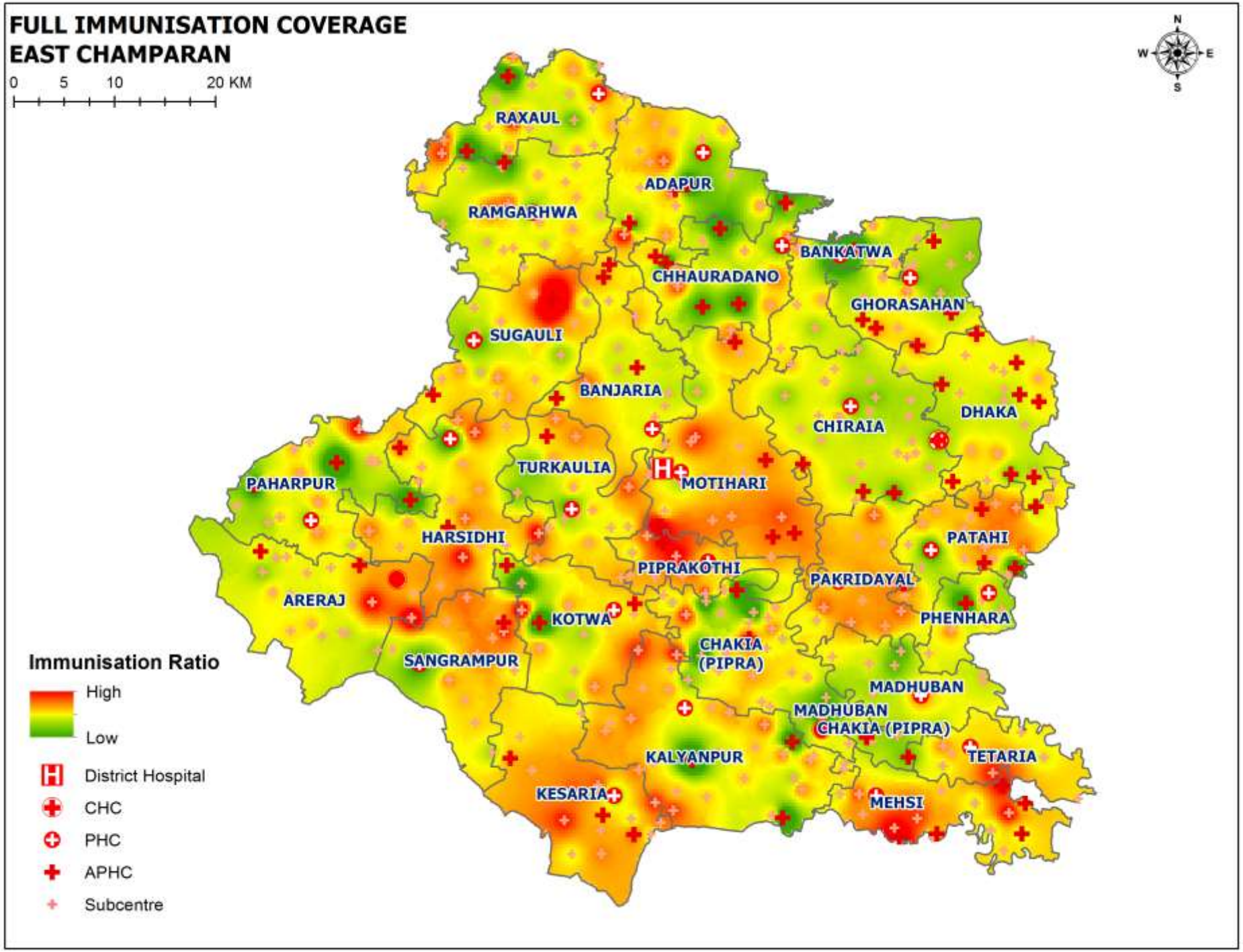
Dr Manosi Lahiri
ML Infomap, India

BACKGROUND TO PROJECT

- Well established fact that prevention of disease by effective immunization program greatly reduces the expense on health care and achieves SDG 3: Good Health and Well-being
- To reach the goal of universal immunization, GIS platform and tools help health officials in planning and operations
- Area of interest: BIHAR, INDIA; area 99,200 sq km
- Population 110 million; villages 45,100; cities 25.

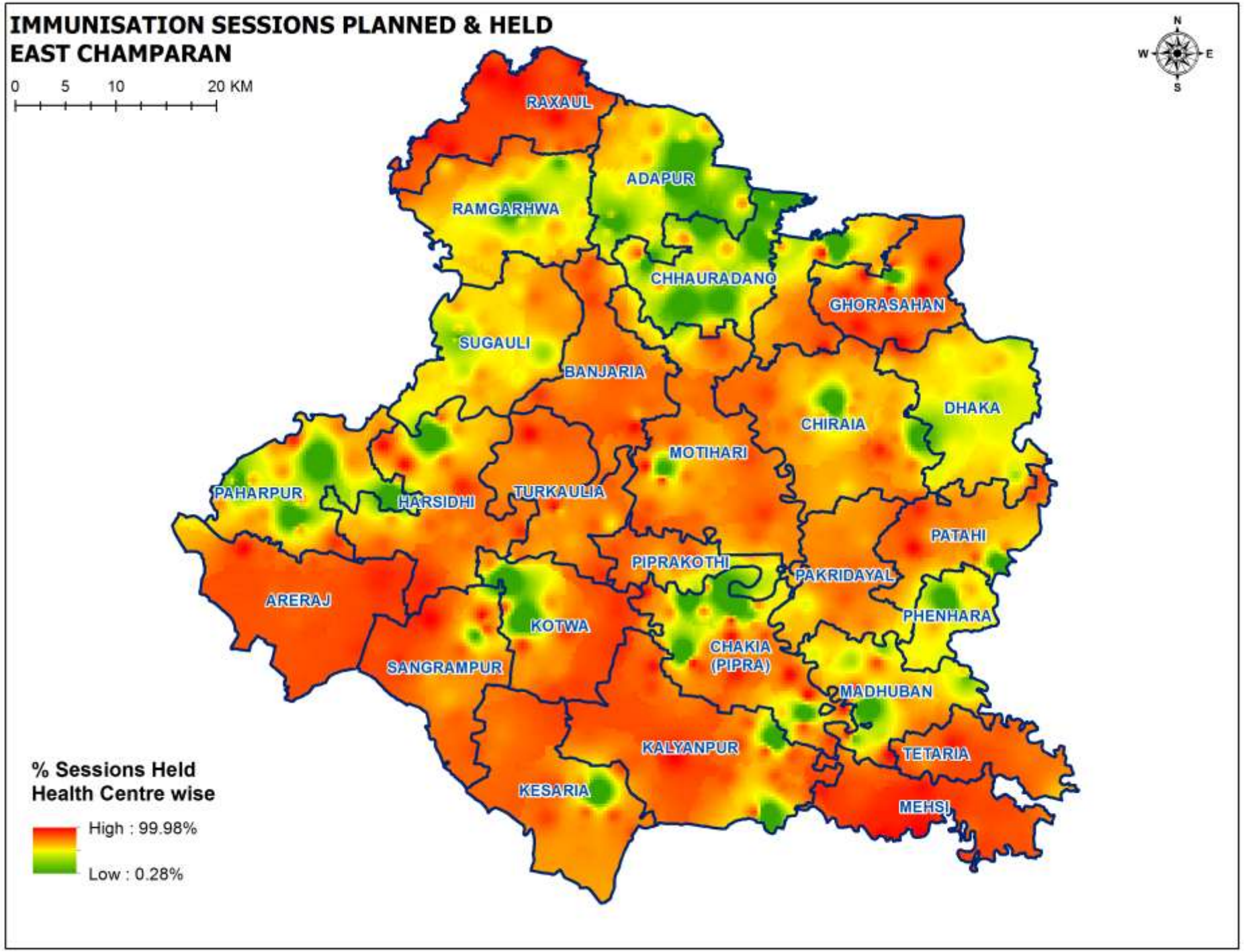
FEATURES OF IMMUNIZATION GIS

- DIGITAL GEOSPATIAL environment enables continuous update of data to evaluate geographical coverage and plan vaccination sessions to reach immunization goals
- Temporal analytics essential as some vaccine doses are delivered in sequence, eg, TETANUS TOXOID and MEASLES
- Spatial analytics ensures vaccines are sent to the designated places, in the right quantity, in the right condition
- Individual data records of pregnant women and children are updated and maintained

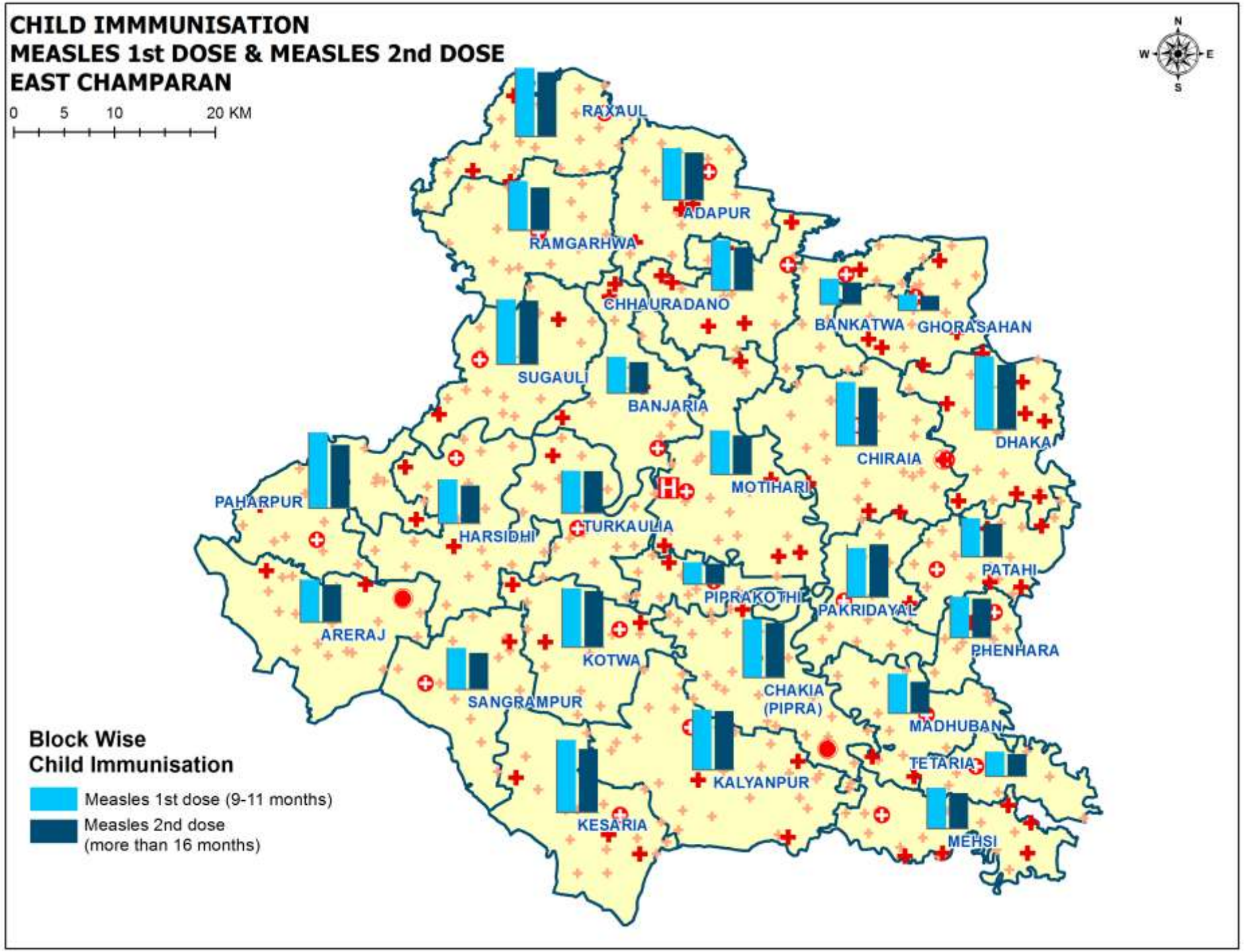


WHERE ARE THE BEST AND WORST PERFORMING AREAS IN EAST CHAMPARAN DISTRICT OF INDIA?

DIRECT RELATION BETWEEN HEALTH CENTRE LOCATIONS AND IMMUNIZATION COVERAGE IS NOT SEEN



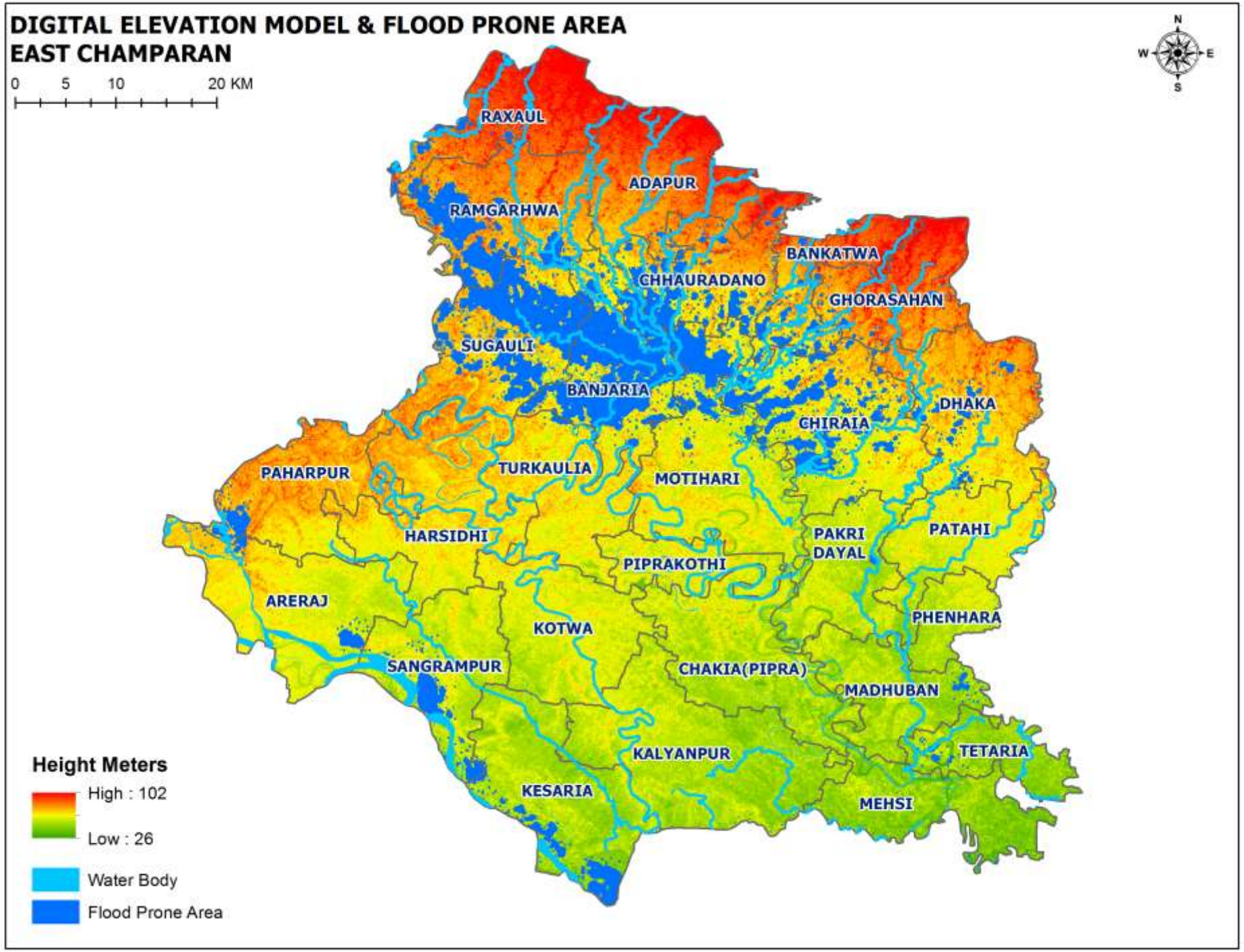
FULL IMMUNIZATION COVER IS LOW IN SOME AREAS WHERE IMMUNIZATION SESSIONS ARE HIGH. WHY DOES THIS HAPPEN?



FEWER CHILDREN GET MEASLES SECOND DOSE. HOW CAN THIS SITUATION BE REMEDIED

DATA ANALYSED BY GEOSPATIAL TOOLS LEADS TO EVIDENCE BASED ACTION

- identifies areas where impact is unsatisfactory
- Improves collection of individual data records
- Looks at larger data sets with variety and depth
- Besides population coverage and vaccine consumption data, considers other factors that may impact outcomes



WHAT IS THE GROUND SITUATION?

MANY AREAS WATERLOGGED FOR SEVERAL MONTHS OF THE YEAR. HEALTH WORKERS CANNOT CONDUCT VACCINATION SESSIONS ROUTINELY HERE.

VERY HIGH DENSITY OF RURAL AND URBAN POPULATION. DAUNTING TASK TO PLAN AND UNDERTAKE FULL IMMUNIZATION HERE.

EAST CHANPARAN DISTRICT IN INDIA
POPULATION: 5 MILLION
AREA: 4000 SQ KM
DENSITY: 1280 / SQ KM
VILLAGES: 1480
CITIES: 1

ONE DISTRICT HOSPITAL IN THE DISTRICT BUT MANY RURAL AND URBAN HEALTH CENTRES WITH MINIMAL FACITITIES

COMPLEX GROUND SITUATION

- WHAT IS THE GROUND SITUATION INFLUENCING VACCINATION?
  - Monsoon rains lead to vast flood prone areas
  - Dense population, poor connectivity
  - Limited health infrastructure
  - Difficulties in maintaining individual health records
- WHAT PARAMETERS AFFECT PERFORMANCE OF HEALTH WORKERS?
- IS THE IMMUNIZATION DATA ADEQUATELY STUDIED FOR INSIGHTS?

HOW WILL A GIS PLATFORM IMPROVE IMMUNIZATION COVERAGE

- The spatial domain adds location and data layers to integrate a complex set of inter-related factors
- Tools for data mining, 3D visualization, modeling and spatial analysis are used on data from multiple sources
- Digital mobile data entry tools for field workers can be used
- Custom dashboards are created for health administrators.

These are initial inferences based on project work.

Thank you for your attention.