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## LEVERAGING GEOSPATIAL ANALYTICS AND LOCATION INTELLIGENCE IN HEALTHCARE GOVERNANCE

Varun Chakravarthy | GeoSmart India 2019 secretariat | 12<sup>th</sup> February 2019



## About us:

Sociometrik was founded in 2018 by a group of economists, data scientists, management consultants and geo-spatial analysts with a common aim to cater to a growing demand for data-led actionable information across a wide set of organizations.

## Vision and mission:

Sociometrik was founded with a vision of tomorrow where actionable intelligence -- leveraging advances in technology and an innovative outlook on the 'status-quo' -- helps overcome the deepest challenges in the world around us. Our mission is to help decision makers leverage the power of evidence and analytics to help optimize decision making. We build solutions to leverage analytics to decision making platforms.

## Our solutions:

We leverage a diverse set of tools and bring together different methods and techniques -- geospatial analytics, location intelligence, evaluation design, big data analytics and micro market estimation -- to provide catered solutions answering decision-makers' most challenging questions.

# The 'status-quo' of evidence

<u>Category</u>	<u>Timeliness</u>	<u>Accuracy</u>	<u>Cost-effectiveness</u>	<u>Scalability</u>	<u>Granularity</u>	<u>Indicator depth</u>
MIS data	High	Low	High	High	Low	High
Primary data collection	High	Low	Medium	Low	High	High
Geo-spatial data	High	High	High	High	High	Medium

# Effectiveness in health care governance

- Understanding the gap
- Understanding the user
- Ensuring better access to services
- Last mile optimization

*“Location-based intelligence is critical. Everything happens somewhere. Insight into ‘where’ makes all the difference in access to care, quality of care delivered, and the opportunity to achieve a positive healthcare outcome,”*

– Dr Este Geraghty, Chief Medical Officer & Health Solutions Director, Health and Human Services Sector, ESRI

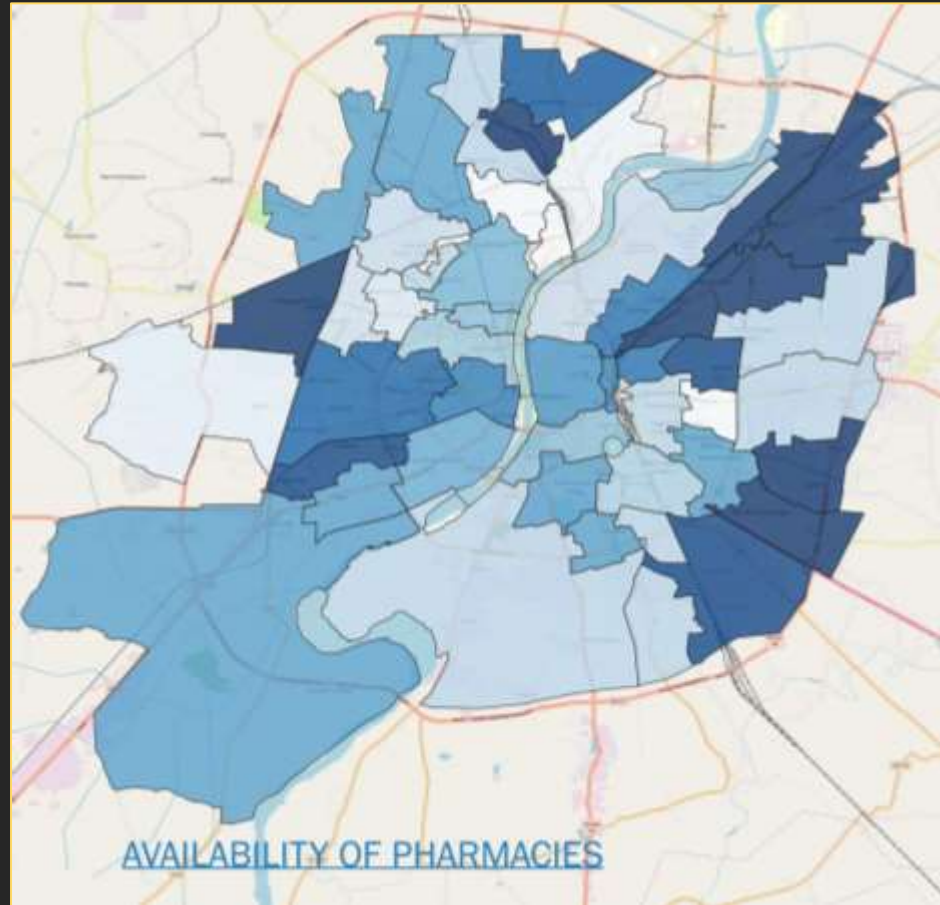
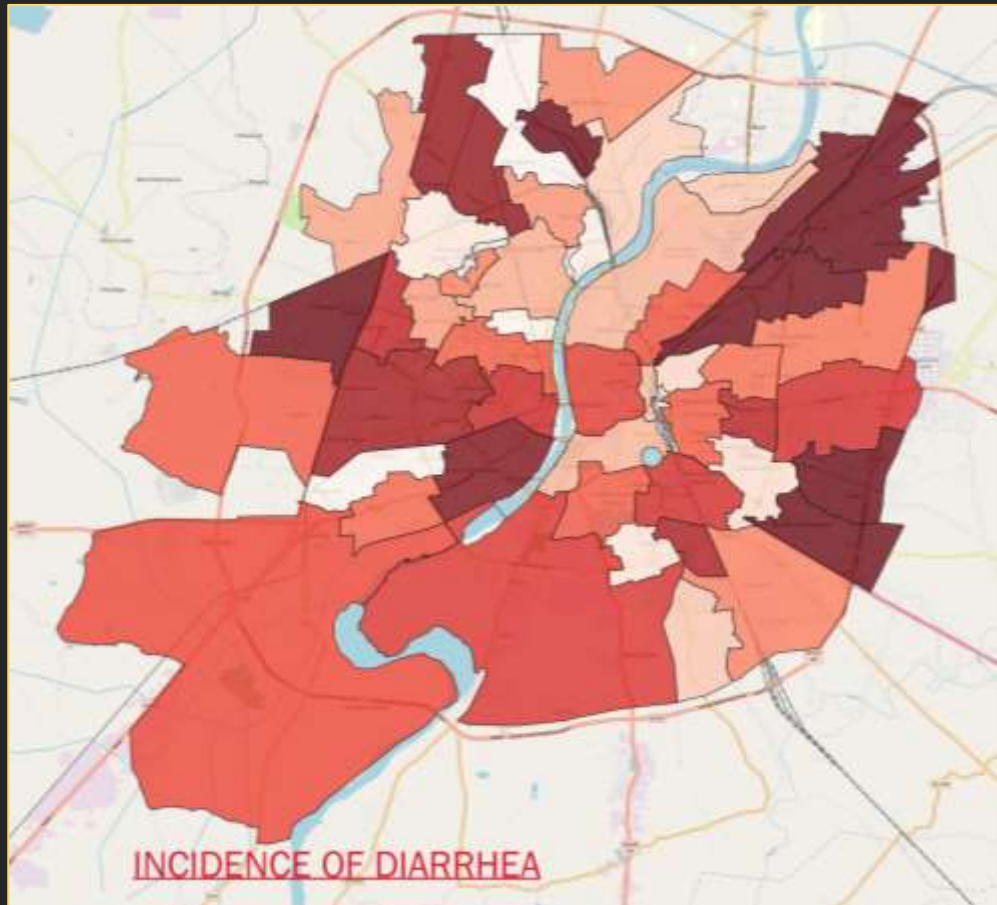
The benefits of location-based intelligence can be leveraged across all steps of the supply chain from planning to last mile execution.

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Geospatial analytics and location intelligence has the potential to take a *'higher-level'* view of the healthcare sector – looking at the supply and demand together

## Demand and supply of pharmacists



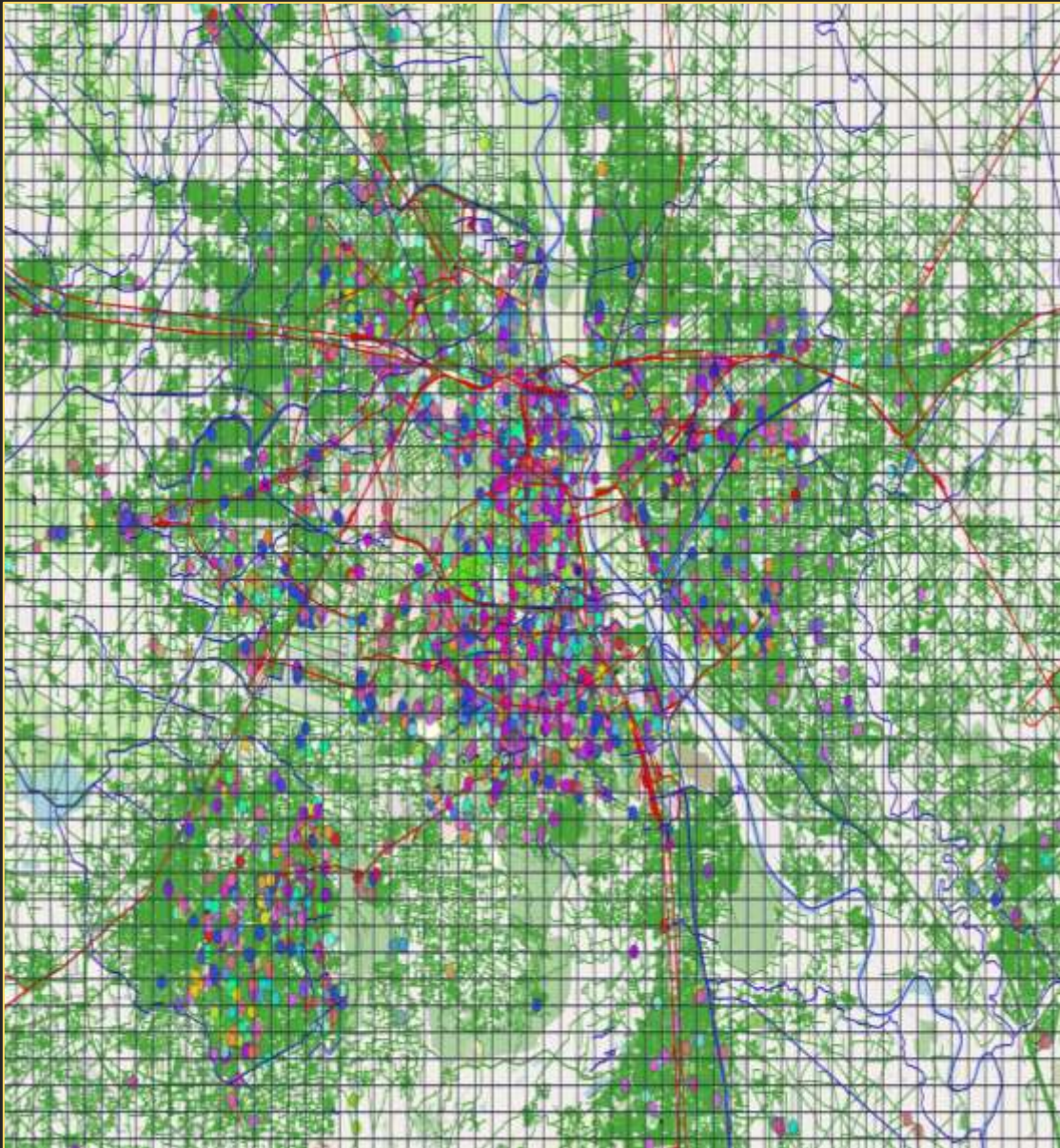
The images above show the incidence of diarrhea and the availability of pharmacies at a pincode level for Ahmedabad. Such images can help provide a snapshot of the demand and supply; and can be useful in identifying gaps that need to be plugged.

# Effectiveness in health care governance

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- **Understanding the user**
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Knowing who the end users/ beneficiaries are; understanding their practices and behaviours is essential to move towards a patient centric healthcare model and concentrate resources better

## Getting a sense of the 'market'



There is an abundance of remote sensing information available very frequently and at very granular levels. These can help get a sense of a wide set of indicators ranging from road access to availability of banks.

Combining this information along with socio-economic and demographic information such as population, expenditure and age composition etc. can provide a rich sense of the market.

This can help conceptualize and targeting of specific healthcare schemes, products and programmes



# Effectiveness in health care governance

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- Understanding the gap

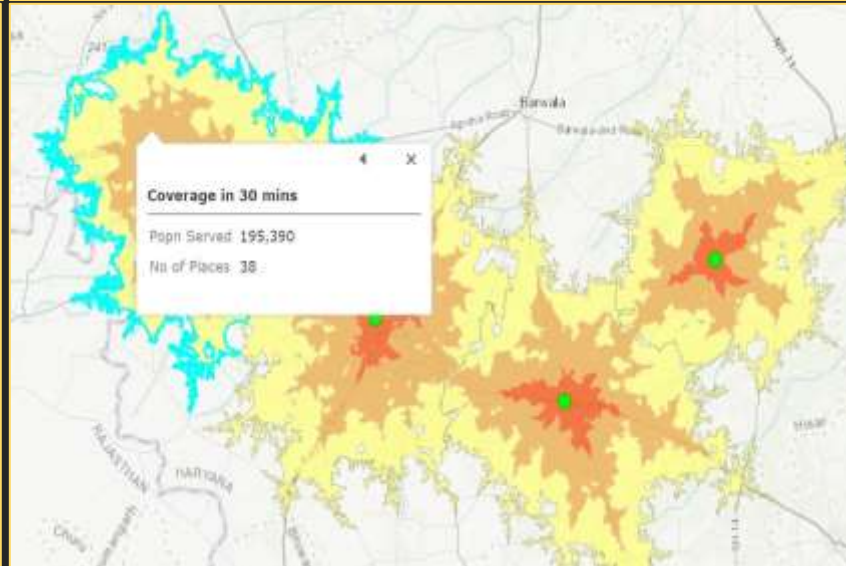
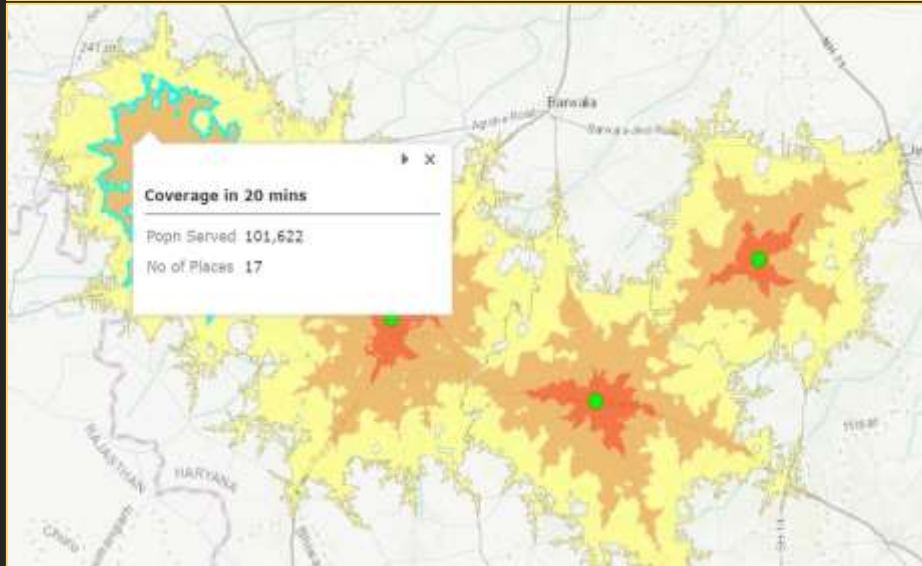
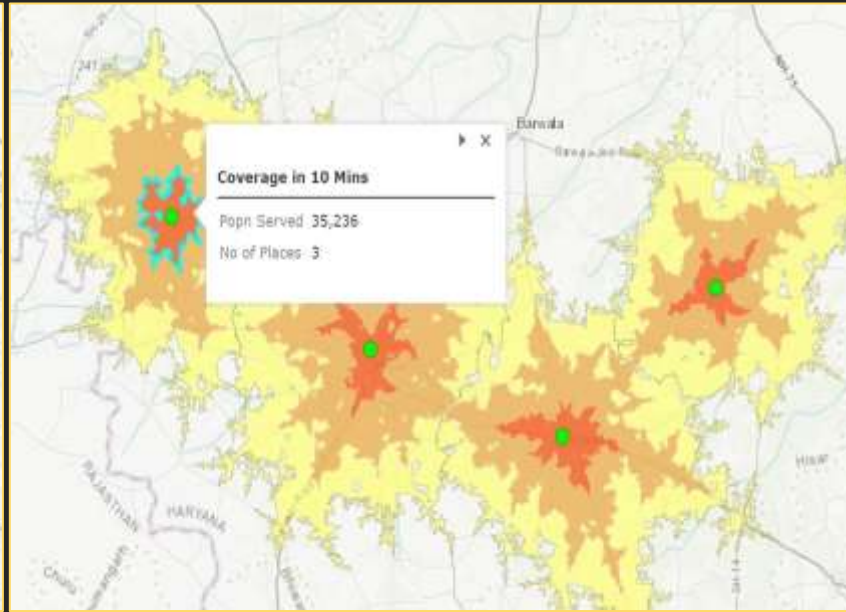
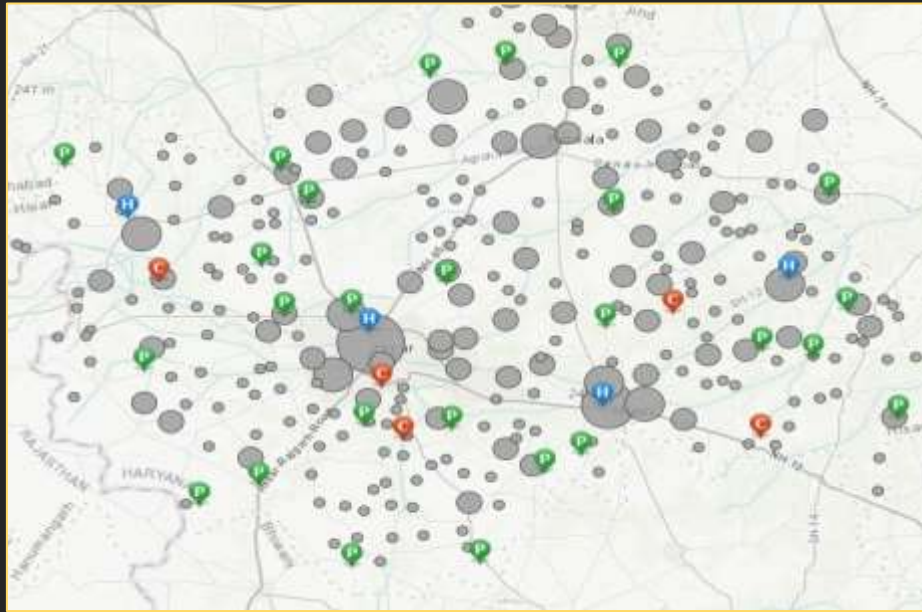
- Understanding the user

- Ensuring better access to services

- Last mile optimization

Better access to facilities and services is essential; and location intelligence can play a crucial role in better planning and targeting

# Identifying ease of access



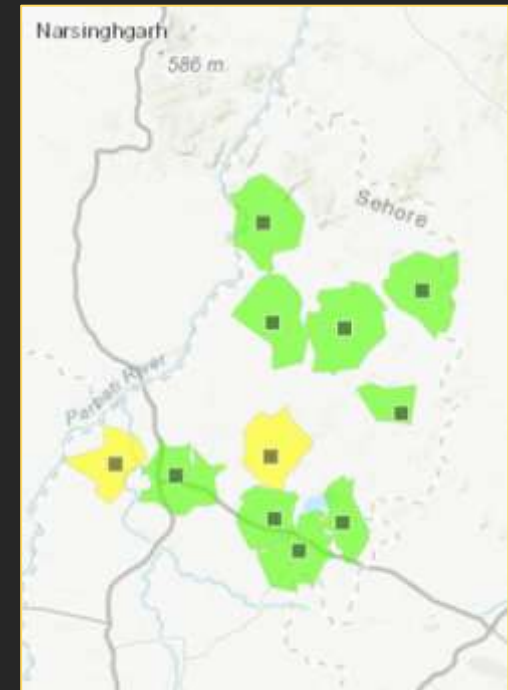
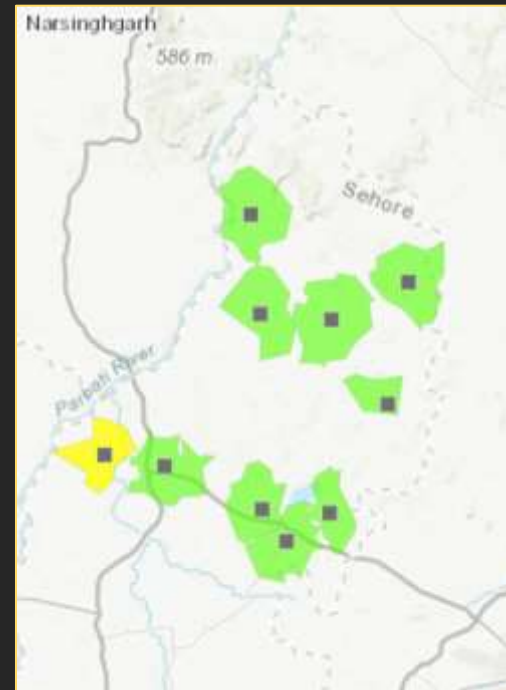
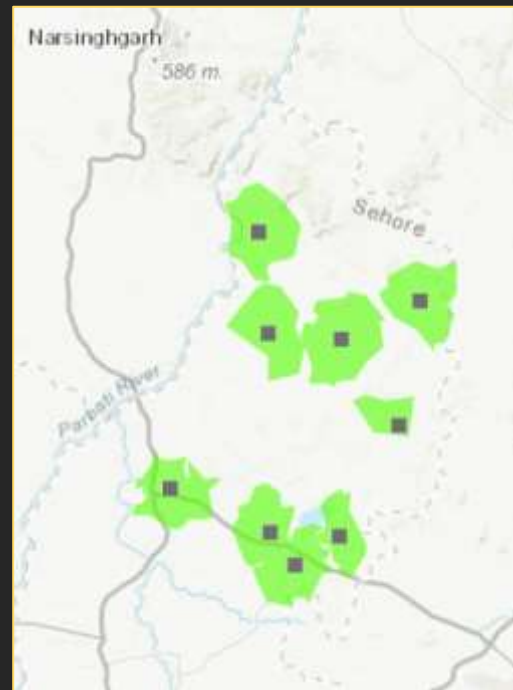
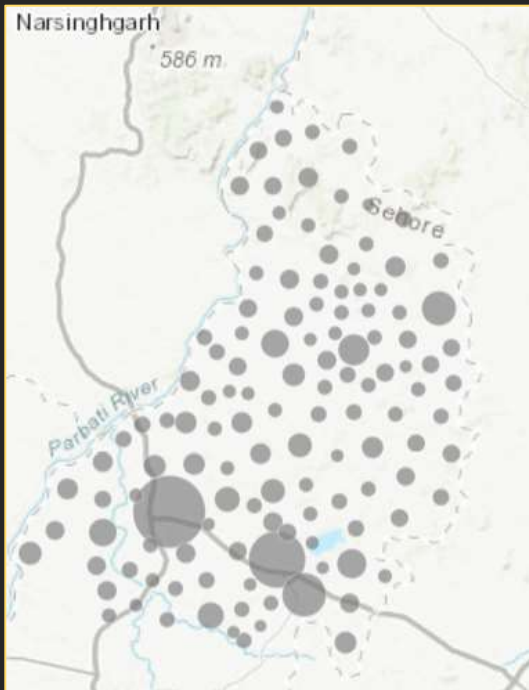
The image(s) on the left looks at emergency access to health facilities in Hisar.

Here the **catchment areas** have been defined in terms of minutes of travel instead of distance.

The image on the top left shows locations for all the villages (along with population) and the health facilities in the district. In the other images (top right, and bottom panel) the green dots represent district hospitals and the catchments around show the distance and the population covered.

Dashboard: [here](#)

# Implementation support



We can also extend the catchment analysis to help position facilities in the best way possible. As an example: The images above are from Shyampur Tehsil in Sehore District, MP. The first image (from the left) shows each of the villages with the population. The second image shows the 9 PHCs which serve this population. At present, **39.7 %** of the population is covered within a 1 km distance of the PHCs.

One additional facility can be placed in a way to ensure maximum additional coverage. For example (third image from the right), coverage is increased by more than **5%** by just adding one more facility whereas coverage is increased by **~8%** by adding two more facilities (right-most image).

Dashboard: [here](#)

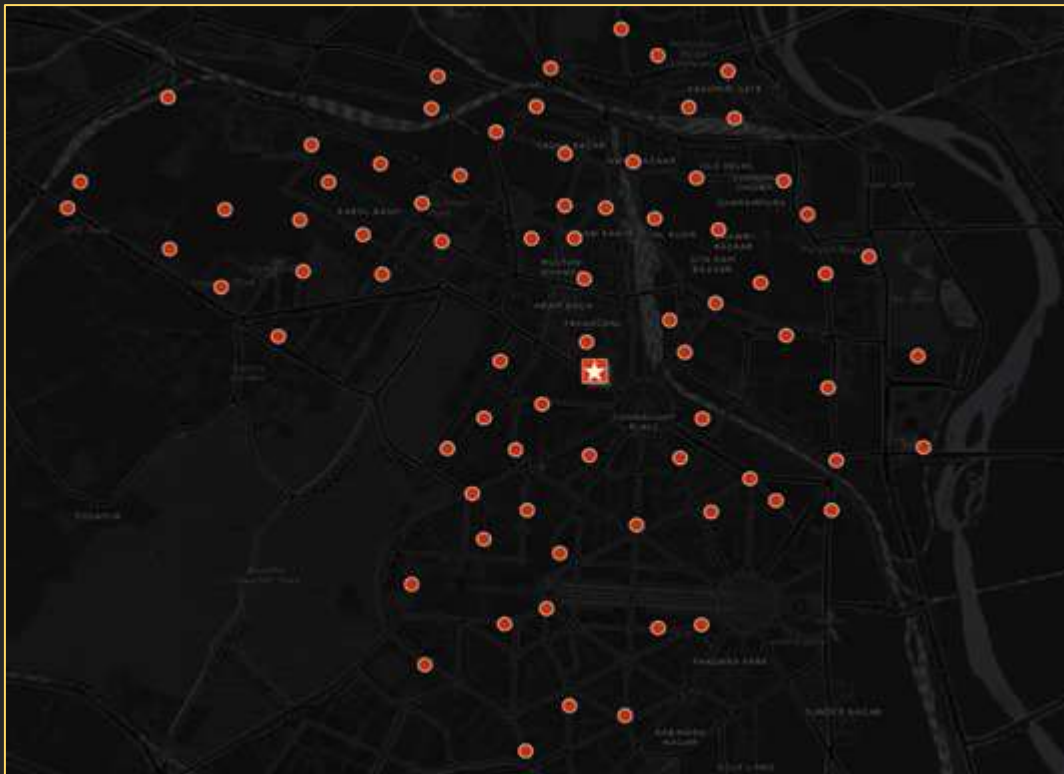
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Optimization – be it best positioning ambulances, mobile dispensaries, warehouses; or using optimal delivery/ access routes has the potential to save crucial resources, time and ensure smoother last mile service delivery.

# Last mile optimization

Network analysis algorithms and a wide set of GIS databases such as road networks, street data and Google API can be used to find the optimal routes and create route charts/maps once sites are identified. This allows for last mile optimization of ground teams be it for distribution of medicines, supplementary nutrition etc.



Location of users



Optimal route

For any comments, queries or suggestions, please reach out to me at [varun@sociometrik.org](mailto:varun@sociometrik.org) or contact me at +91-9999615031

**THANK YOU!!**