Choropleth Mapping

As a tool of advocacy in Primary Health Care and Public Health Practice
Apollo Mission

Mission Statement

“Our mission is to bring healthcare of international standards within the reach of every individual. We are committed to the achievement and maintenance of excellence in education, research and health care of the benefit of humanity”

Dr Prathap C Reddy
Founder Chairman
Apollo Hospitals Group
Apollo Institutes
Apollo Institute of Medical Sciences and Research
Primary Health Centers
Primary Health Centers
Public Health: Review Meetings
Apollo Institute of Medical Sciences and Research

Dr Sairam Challa
Dept of Community Medicine

Dr Snigdha Pattnaik
Dept of Adult Infectious Disease

Dr Dilip Mathai
Scope:

• Advocacy
• The Public Health Process
• Historical Role of Mapping in Public Health
• Choropleth Map
Advocacy:

• “to advocate” means to espouse a cause by argument, to **plead in favor** of, to recommend publicly

• The business of improving population health has always been linked to action
The Public Health Process:

1. Document the PH Problem
2. Analyze the determinants
3. Act
4. Document the Effect of Action
Historical Role of Mapping in Public Health
1848 Cholera Epidemic

John Snow (15 March 1813 – 16 June 1858)
Broad Street pump

19/7 to 26/7
The tale of the Broad Street pump spread across London, as others—no longer Snow alone—began to advocate the provision of clean water.

Among the various tools of Public Health Advocacy, Health Communication & Social Marketing Practice include Map Making as a rich tool for appropriate communication.
Advocacy : A Case Study
Advocacy: An Example of Measles Outbreak
Advocacy: An Example of Measles Outbreak
Advocacy: An Example of Measles Outbreak
Advocacy : An Example of Measles Outbreak
Advocacy: An Example of Measles Outbreak
Spot map shown location of measles cases
Districts with Low Immunization Coverage: 201
Advocacy: An Example of Measles Outbreak
Advocacy: An Example of Measles Outbreak
Advocacy: An Example of Measles Outbreak
Choropleth Map

• A thematic map in which areas are shaded or patterned in proportion to the measurement of the statistical variable being displayed
• Choropleth Maps are effective tools of visualizing Health Indicators across areas.
• Centers for Disease Control and Prevention, (CDC) Atlanta in 2012 has released “Cartographic Guidelines for Public Health” through The Geography and Geospatial Science Working Group (GeoSWG) an organization of geographers, epidemiologists, statisticians, and others who work with spatially-referenced data
Objective:

• To develop a simple way to create Choropleth maps of health indicators in low resource setting like a Primary Health Center.
Methodology

• Windows based spreadsheet, MS Paint are used for crating Choropleth Maps.

• Conditional Formatting and Colour scales are used for grading IMR (Infant Mortality Rates) across the states of India as an example
<table>
<thead>
<tr>
<th>State</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haryana</td>
<td>36</td>
</tr>
<tr>
<td>INDIA</td>
<td>39</td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>39</td>
</tr>
<tr>
<td>Bihar</td>
<td>42</td>
</tr>
<tr>
<td>Chattisgarh</td>
<td>43</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>46</td>
</tr>
<tr>
<td>Meghalaya</td>
<td>46</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>48</td>
</tr>
<tr>
<td>Assam</td>
<td>49</td>
</tr>
<tr>
<td>Odisha</td>
<td>49</td>
</tr>
<tr>
<td>Madhya Pradesh</td>
<td>52</td>
</tr>
</tbody>
</table>
Methodology

- Health Management Information System under Ministry of Health & Family Welfare, Government of India is used as a database for Health Indicators, the **IMR of different states** was taken from the database in this current demonstration.
Figure 1 Choropleth Map of India depicting IMR: 2014

Infant Mortality Rate of Various States in India: 2014
Methodology

• When mapping quantitative data, a specific colour progression is used to depict the data properly. There are several different types of colour progressions used by cartographers.

• Bi-polar progressions are normally used with two opposite hues to show a change in value from negative to positive or on either side of some either central tendency, such as the mean of the variable being mapped.
Implications

• Advocacy is a major managerial tool when implementing various health programs like RMNCH+A program (Reproductive, Maternal, Newborn, Child and Adolescent Health).
Implications

• Whether, in a Primary Health Center or at the District Magistrate, when advocating health inputs or outputs, it becomes a challenge to Medical officer to convince stake holders on Health Indicators.
Advocacy : An Example of Maternal Death Review
Advocacy: An Example of Maternal Death Review
Implications

- The **Intersectoral Coordination** and **Community Participations** which are the foundations of Primary Health Care require a Behavioral Charge of public in general and public policy makers and implementers in particular.
Implications

• For example a district or village may have a higher IMR due to diversion of electricity for non-medical uses which is affecting the vaccine cold chain leading to failure in vaccination which inturn is leading to more outbreaks of VPDS (Vaccine Preventable Disease)
Implications

• While graphs may be used to convince the administrators about higher IMR of the concerned district
• they may accept this fact more easily when they see their district is getting reflected badly in terms of the colour of their districts with reference to neighbouring districts
Disease Alert

- Disease Alert: Volume 1 Issue 1 (Jan 16) [1305 KB]
- Disease Alert: Volume 1 Issue 2 (Feb 16) [1276 KB]
- Disease Alert: Volume 1 Issue 3 (March 16) [1382 KB]
- Disease Alert: Volume 1 Issue 4 (April 16) [987 KB]
- Disease Alert: Volume 1 Issue 5 (May 2016) [1969 KB]
- Disease Alert: Volume 1 Issue 6 (June 2016) [1175 KB]
- Disease Alert: Volume 1 Issue 7 (July 2016) [1269 KB]
## Recent Weekly Outbreaks

<table>
<thead>
<tr>
<th>YEAR</th>
<th>WEEKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>1st 2nd 3rd 4th 5th 6th 7th 8th 9th 10th 11th 12th 13th 14th 15th 16th 17th 18th 19th 20th 21st 22nd 23rd 24th 25th 26th 27th 28th 29th 30th 31st 32nd 33rd 34th 35th 36th 37th 38th 39th 40th 41st 42nd 43rd 44th 45th 46th 47th 48th 49th 50th 51st 52nd 53rd</td>
</tr>
<tr>
<td>2015</td>
<td>1st 2nd 3rd 4th 5th 6th 7th 8th 9th 10th 11th 12th 13th 14th 15th 16th 17th 18th 19th 20th 21st 22nd 23rd 24th 25th 26th 27th 28th 29th 30th 31st 32nd 33rd 34th 35th 36th 37th 38th 39th 40th 41st 42nd 43rd 44th 45th 46th 47th 48th 49th 50th 51st 52nd 53rd</td>
</tr>
<tr>
<td>2014</td>
<td>1st 2nd 3rd 4th 5th 6th 7th 8th 9th 10th 11th 12th 13th 14th 15th 16th 17th 18th 19th 20th 21st 22nd 23rd 24th 25th 26th 27th 28th 29th 30th 31st 32nd 33rd 34th 35th 36th 37th 38th 39th 40th 41st 42nd 43rd 44th 45th 46th 47th 48th 49th 50th 51st 52nd 53rd</td>
</tr>
<tr>
<td>2013</td>
<td>1st 2nd 3rd 4th 5th 6th 7th 8th 9th 10th 11th 12th 13th 14th 15th 16th 17th 18th 19th 20th 21st 22nd 23rd 24th 25th 26th 27th 28th 29th 30th 31st 32nd 33rd 34th 35th 36th 37th 38th 39th 40th 41st 42nd 43rd 44th 45th 46th 47th 48th 49th 50th 51st 52nd 53rd</td>
</tr>
</tbody>
</table>
Conclusion

• Choropleth Mapping can be an effective Advocacy Tool in Public Health
• Wide gaps exit in its use as a tool for lack of awareness and training