

State wise health indicator:

Assessment of Maternal and Child Health Status in Madhya Pradesh

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1. Introduction

GIS study emphasize the geographical element of accessibility to the services. Integrating GIS with Healthcare would enhance the quality of the service and would result in paradigm of Geohealth, HGIS and Smart hearth concepts. The geography of health care consist of the analysis of spatial organization in terms of number size, types, and locations of health services, how and why spatial organization changes over time, how people have access to health services, and the impacts on health and well-being (McLafferty, 2003). Through spatial visualisation of health related indicators the users are empowered with bettern understanding about changing behaviour and dynamics of the factors. The parameters emphasised in this mission includes; Reproductive, Maternal, Neonatal, Child (0-6 age group) and Adolescent Health (RMNCH+A), and Communicable and Non-Communicable Diseases (Department of Health and Family Welfare, 2017). As a case study, Madhya Pradesh, India is selected to assess the state health performance. According to the Ministry of Health & Family Welfare et al. (2017), Madhya Pradesh is scored the lowest and ranks at the bottom. The state has poorest maternal and child health (MCH) indicators in India. Madhya Pradesh was recognised as one of the 'BIMARU'¹ states for its economic backwardness, which is one of the trigger factor for poor health services. The MCH index is computed for limited indicators of Child and Maternal health. Along with the health profile, demographic and social profile are also considered.

2. Method

2.1. Contextual Setting

Madhya Pradesh is located at 22.9734° N, 78.6569° E with the area of 3,08,000 sq. km makes it the second largest state in India. Bhopal is the capital city of the state. The population of the state according to Census of India (2011), 7,25,97,565 and population density is 236 persons per sq.km. The health scenario of the Madhya Pradesh is not in the good state, according to the Ministry of Health & Family Welfare et al. (2017), the state is ranked 17th out of 21 states and poorest in the maternal and child health indicators. Madhya Pradesh is referred to as the Empowered Action Group (EAG), provided dedicated mentor support as it is scored the lowest. There are 270 community health centres, 1149 primary health centres and 8,834 health sub centres in the state to provide preventive in 2008 (Jat et al., 2011).

2.2. Data

The assessment of MCH status at district is carried out for the year 2008-09 and 2017-18. The MCH services considered viz. antenatal care (ANC), child health, child immunization, Institutional facility and safe deliveries. The state is divided into 48 districts and these districts are considered in the study. The indicators (mentioned in the Table 1) are selected based on the data availability from the reliable sources like Census of India 2001 & 2011, Madhya Pradesh Health Bulletin (Government of Madhya Pradesh, 2017) and Health Management Information system (HMIS) Standard reports (Ministry of Health & Family Welfare, 2016). The spatial dataset viz. district boundaries was considered to visualise the pattern.

2.3. Methodology

The methodology of the study is divided into three stages; pre-analysis, analysis and final output (Figure 1). The pre-analysis stage includes data collection and preparation. In analysis stage, maternal health and Child Health indices was developed for 2008-09 and 2017-18. The index is calculated as a weighted average of various indicators, focused on measuring the state of MCH in each district. The indicators of Child and Maternal health along with demographic and social indicator related to female development are considered for the indices

¹ BIMARU is an acronym stating the poor economic conditions of the states viz. Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh (Som & Mishra, 2014).

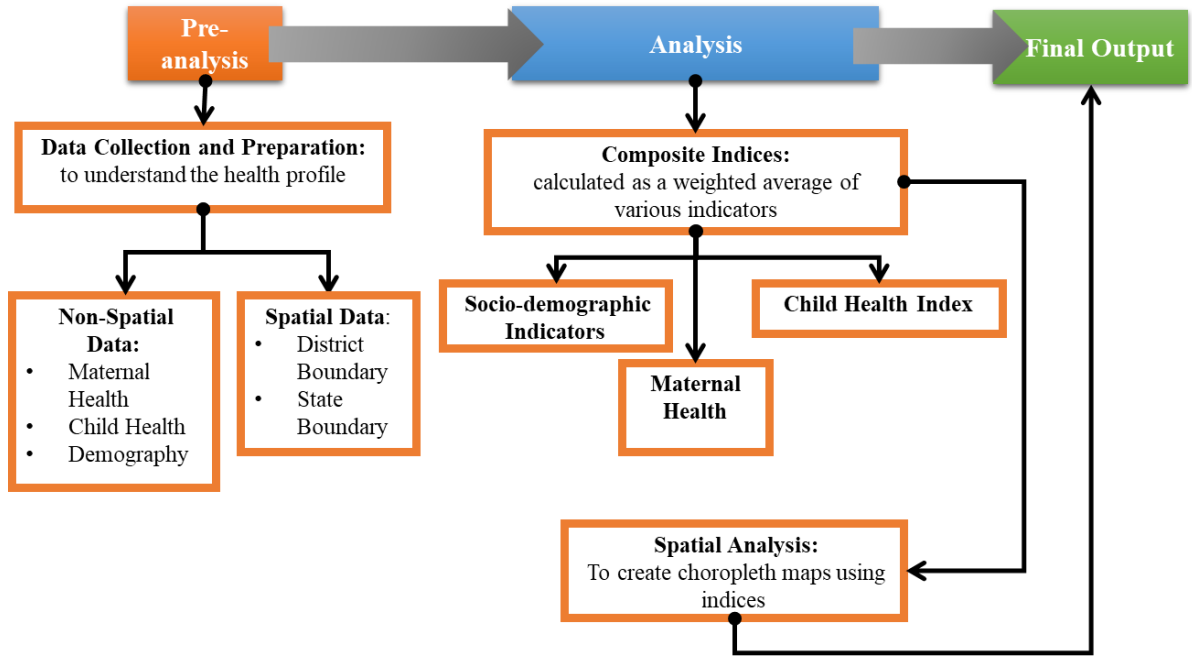


Figure 1 Methodology for the study

The indicators are grouped into positive and negative indicator. The higher the indicator value represents better state of health of the people than they are positive indicators like birth rate, life expectancy and if the higher value represents the worse state of health of the people like mortality rate (Pan American Health Organisation, 2014). The grouped indicators further are standardized to make them uniform. The positive and negative indicators are standardized as (Sharma et al., 2011):

$$\text{For a Positive indicator- } Xi = \frac{Vi - \text{Minimum}}{V \text{ Maximum} - \text{Minimum}} * 100$$

$$\text{For a Negative indicator- } Xi = \frac{Vi - \text{Minimum}}{V \text{ Maximum} - \text{Minimum}} * 100$$

Where V_i is the value of an indicator for i^{th} district.

$$Wi = \frac{1}{\sqrt{\text{Var}(Xi)}} \div \sum \frac{1}{\sqrt{\text{Var}(Xi)}}$$

Using these weights a composite index is computed as $Ci = \sum_{i=1}^n Wi * Xi$

Xi is the standardized value of an indicator and Wi is the weight allocated to that particular indicator and n is the number of indicators included in the composite index.