

Dimensions of Inequality in Health: A Case Study of Balochistan Pakistan

¹Syed Nawaz ul Huda, ⁴Farkhunda Burke, ²Qamar ul Haque, ³Salma Hamza

¹Muhammad Azam and ⁴Muhammad Miandad

¹Department of Geography, ²Department of Chemistry,

³Department of Geology, Federal Urdu University of Arts,
Science and Technology, Karachi, Pakistan

⁴Department of Geography, University of Karachi, Karachi, Pakistan

Abstract: A healthy body and mind is the foundation of a healthy society. Socio-economic development or cultural enhancement is impeded by improper health of individuals. Variations in health recognize that socio-demographic conditions are important in determining a person's chances of having poor health. Therefore, some available indicators to this effect have been included in the study. Health of a community depends not only on the availability of health services but also on the prevalent hygienic conditions. In the present era, when new diseases erupt frequently due to several reasons, new techniques for elimination are also discovered, thanks to advanced technology. Although in terms of natural resources and geographical location Balochistan is one of the best sites in Pakistan yet on the basis of socio-economic conditions it is widely known as a backward province. The capability of the populace to absorb the maximum benefit of its resources and the facilities availed by the government is also marred by low literacy standards and this goes on in a vicious circle. The people of the province are facing dire conditions in terms of all basic needs, especially health facilities. This study also highlights the prevalent trends in health facilities provided by the government in the province.

Key words: Balochistan, inequality, standard nutrition units, crude birth rate, public health centers

INTRODUCTION

Health of a community depends not only on the availability of health services but also on the prevalent hygienic conditions. In the present era, when new diseases are erupting due to several reasons or being discovered, efforts for developing, new techniques for their elimination are also being made with some success. Graham *et al.* (2004) describes in the perspective of health study. Geographers, we believe have much to contribute to this emerging and vibrant field of health research. In particular their traditional concerns with spatial distribution, place, environment and scale can all be directed to improving our understanding of health variation. Health services are a basic need of mankind. Usually, health is a priority area of government activities. The high correlation between the expenditure on health and productivity in developing countries like Pakistan is enough to emphasize the importance of delivery of health services as an aid to development (GoP, 2002).

Being human requires the satisfaction of needs or wants. This is the origin of motivation for human actions, from buying a beer to planning a region. Satisfying needs

or wants involves cooperation with other people, for no one is completely self-contained. This also leads to competition. The regulation of human behavior in the pursuit of needs and wants is the prime source of social relationships, political institutions and modes of production. One of the greatest dangers in the present situation of development inequality is its potential for human conflict. There is wide variation in health outcomes for countries or areas with similar levels of income and education. Balochistan reveals a lagging stance in terms of socio economic development, which is a major cause of much disparity among the provinces.

It cannot be denied that social conditions, especially poverty, affect physical well being and length of life. Public health practitioners do have a responsibility to design policies that reliably prevent diseases, reduce contagion and minimize injury but they are sorely mistaken in thinking that they have special expertise in changing the income distribution, in defining social justice, or in producing the instruments that can help attain it (Satel and Marmor, 2001).

There is general agreement that to reduce socio economic inequality and make appropriate trade-offs

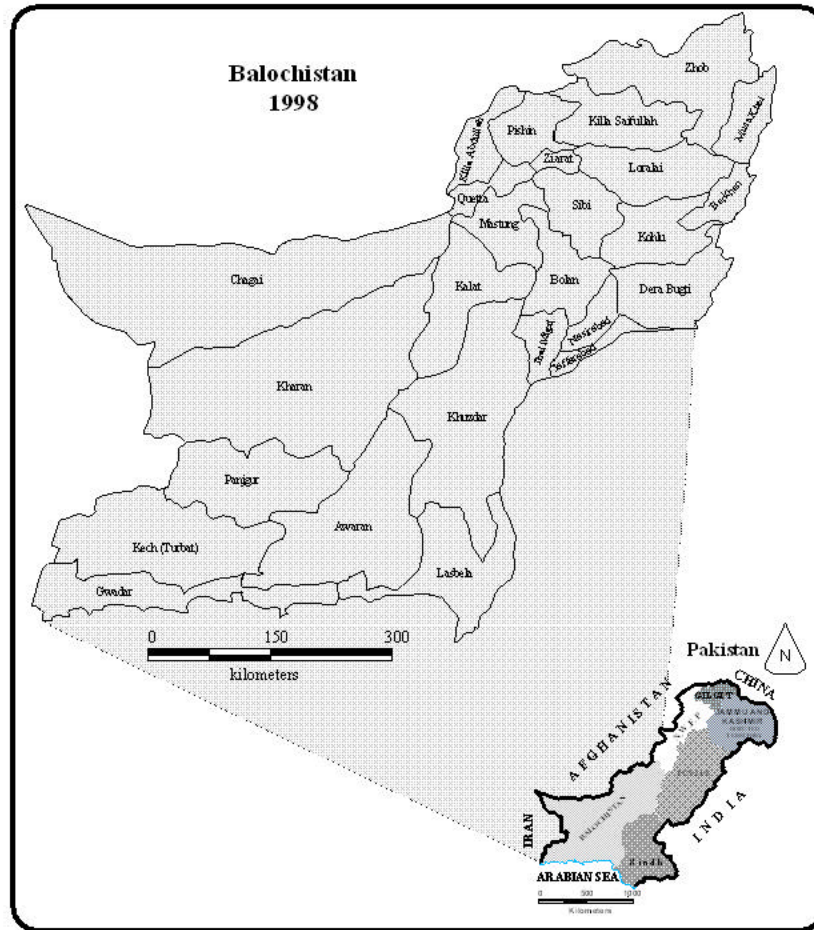


Fig.1: Location of study area

between available policy options requires measures of disparity mitigation that are fit for the purpose and are regularly monitored (Kunst, 1997). Without adequate monitoring, the causes of inequality cannot be understood and progress towards reduction in inequality cannot be assessed.

Several studies of health inequalities in the backdrop of geographical perspectives are present; studies that provide evidence concerning the nature, magnitude and policies of concerned authorities. There are varieties of spatial analysis of health inequalities within Europe, (Kunst, 1997; Ben-Shlomo *et al.*, 1996), within countries such as England and Wales (Wiggins *et al.*, 1998; Gould and Jones, 1996; Senior, 1998) and within particular regions (e.g. the classic work on northern England by Townsend *et al.* (1988) and in Wales by Higgs *et al.* (1998). The turn to a social model of health has had a significant impact upon research undertaken by health

geographers (Brown and Duncan, 2002). In Pakistan not much evidence is found regards study of health and place.

As geographers, our key question is 'does where you live matter to your health?' In the eighteenth and nineteenth centuries, when infectious diseases were the main cause of death, there was arguably a more obvious relationship between where someone lived and their chance of contracting a fatal infection. Major cities, where diseases like smallpox and later cholera were endemic, experienced much higher rates of infection and death year on year than did more rural areas (Wrigley *et al.*, 1997; Woods, 2000).

The World Health Organization's (WHO) emphasis on human health led to the Healthy Cities Movement, which developed indicators to assess improvements in public health (Waddell and Steve, 1995).

The present study is in the context of existing health facilities, which are provided by the government. Most studies which have investigated variation in health recognize that the individual's socio-demographic characteristics are important in determining a person's chances of having good/poor health.

Study area: Balochistan is located at the eastern edge of the Iranian plateau and in the border region between Southwest, Central and South Asia. It is geographically the largest of the four provinces with an area of 347,190 Km². and composes 44% of the total land area of Pakistan. The population density is very low due to the mountainous terrain and scarcity of water. Balochistan lies between 24° 53' and 32° 05' north latitudes and 60° 52' and 72° 18' east longitudes. It is bounded on the north by Afghanistan and FATA (Federally Administrated Tribal Area), on the northeast by Punjab province, on the east by Sindh province, on the south by the Arabian Sea and on the west by Iran (Fig. 1). Covering 347,190 Km². Balochistan is the largest province of Pakistan with its capital at Quetta. It is made up of 6 administrative divisions. Although Balochistan has a good geographical location and is rich in natural resources, on the basis of socio-economic conditions, it is recognized as the most backward province of Pakistan (Haider, 2004).

MATERIALS AND METHODS

Selection of indicators and data source: The year 2005 marked the 20th anniversary of the WHO's Global Strategy for Health for All by the Year 2000, proposed 38 targets to reduce inequalities in health. One of its main aims was ensuring equity in health by reducing gaps in health status between countries and between population groups within countries (Shaw *et al.*, 2005).

In order to consider the changing geography of health (in this case we can use different variables as indicators of health of a population) comparative studies are needed. Geographical boundaries, which frequently change because of administrative and political reasons, need to be frozen in order to compare areas over time (Shaw *et al.*, 2004). This has been done in the case of Balochistan. In 1998 there were 26 districts but now they have increased to 30 due to the formation of Noshki, Washuk, Sherani and Hernai which were formed in the last five years but for the present study the administrative boundaries have been frozen as per year 1998.

The geographical study of health inequalities often makes use of data aggregated for area units. Whether the topic of study is the incidence of a specific disease,

general level of health in a community, or access to medical services, data may only be available aggregated to the level of census tract, ward and county or postcode sector. Analysis for regional planning is informed by a variety of data sources and research perspectives, among which census data continues to play an important role. In United Kingdom the EDs i.e. Enumeration Districts are the smallest census data collection unit (Martin, 2004). The present study is based on 1998 Census data, which was collected at District and Charge levels.

Nowadays, with authorities having greater responsibilities for health and welfare, decision makers require indicators that could show in which direction a particular situation is tending. Ideally, a valid indicator system for health and social welfare should consist of a relevant series of measurements that are easily understood and obtainable. Social indicators provide a concise overview of social trends and policies while paying due attention to the different national conditions in which such policies are being pursued.

Trewin (2001) confirms that social indicators can indicate how social conditions are changing when produced repeatedly over time. The social indicators in Society at a Glance (OECD, 2003) may be represented along a two dimensional classification. The first dimension corresponds to three main goals of social policy, i.e. self-sufficiency, equity and social cohesion. The second dimension corresponds to the nature of the indicators, i.e. social context, social status and societal responses. According to Trewin (2001) good indicators should be able to do more than simply measure or monitor the achievement of wellbeing, they should be able to identify the need for change indicating what and how to change certain situations or attributes to achieve particular goals. Consistent with this aim, this study reconsiders the findings regarding indigenous research indicators /measures within a framework of goals, context principles and action principles which Walker *et al.* (2003) claim is crucial to the achievement of indigenous facility determination and wellbeing.

Most studies which have investigated variation in health recognize that individual socio-demographic characteristics are important in determining reasons for a person's chance of having poor health. People in lower social classes (Pecock *et al.*, 1987): the unemployed (Bartley, 1994) and women (Miles, 1991) report and/or experience ill health at higher rates. There is also increasing evidence that certain characteristics of the area in which an individual lives may have a significant role to play in mediating these individual level relationship e.g. Shouls *et al.* (1997), Congdon *et al.* (1995), Hamm *et al.* (1987), Gould and Jones (1996) and Ellaway and Mackintyre (1996) have all found area of residence and

Table 1: Selected indicators with abbreviations

Crude Birth Rate	CBR
Percentage of Public Health Centers/total Population	PHC
Percentage of Hospital /Total Population	H
Percentage of Available Beds (Allopathic Hospitals and Public Health Centers)/total Population	BAH
Percentage of Doctor /Total Population	D
Percentage of Lady Health Workers/total Female Population	LHW
Percentage of Children Immunized and Vaccinated/children less Than 10 Years	CTV
Standard Nutrition Units/persons per Annum	SUN

individual characteristics to be independently related to health. However, in the case of a developing country like Pakistan while selecting indicators consideration should be given to the likelihood of availability and the possibilities of development of the requisite basic data. Although several frameworks for measuring health system performance have been proposed (Christopher *et al.*, 2000), data constraints exist in developing countries. The variables selected for the study are both direct and indirect indicators of health care development.

Table 1 is the list of variables for the present study, which have been selected on the basis of their availability on a spatial basis and relevant to the nature of the study. The first variable i.e. Crude Birth Rate is a reflection of the social values prevalent in a society. It has also been observed that high crude birth rates raise the cost of maintaining a given health level (Toor and Butt, 2005).

The second variable i.e. Public Health Centers are an indication of the availability of free or subsidized health service to the masses and although there are not very heartening reports on the functioning of these centers yet its inclusion was thought logical to show the inequality in the availability of health service to the masses. PHC could be defined by what it is not: it is neither secondary nor tertiary curative care, but all other activities related to health, from nutrition to sanitation. Even more ambitious definitions view PHC as a part of social revolution (Decosas, 1990).

The percentage of hospitals and hospital beds to total population, though somewhat ambiguous in the measurement of inequality, because they indicate the extent of illness needing hospital care, has been included. Its inclusion in the form of service in relation to population indicates the inequality in access to medical facilities. However, this and the number of doctors to total population reflect effective demand inequality for care offered on a fee-for-service basis. A multiplicity of factors influence the misdistribution of doctors, ranging from general social and economic inequity, difficult access to the medical education system, payment incentives, public/private health system development and slack social movement for crusading spirits (Wibulpolprasert, 1999).

Social indicators are able to assess changes to disadvantaged groups over time and hence assist in the

direction of ongoing policy decisions. Social indicators can assist policymakers to better understand which individual, families and groups are experiencing disadvantage so that their particular needs 'can be effectively targeted by government interventions, benefits and services'. However, the importance of the role of indicators in measuring social well being and the associated links to government policy decisions and actions raise a number of crucial issues which need to be taken into account in relation to this study. In the present study, complete data in regard to the spatial distribution of various diseases was not available hence could not be included.

The last variable selected on the basis of per year food requirement of the study area, Standard Nutrition Unit (SNU) is directly related to the production of food crops. Since carbohydrate intake is so critical, this is generally the nutrition measure used to show differences in diet and food intake levels from one part of the world to another and is measured in calorific values (Burke *et al.*, 2005, 2006a).

RESULTS

Technique of inequality measurement

Z-score model: No project can survive for long if the data produced are not put to proper use and these are possible by quantitative methods. The identification of broad spatial pattern of inequality requires the derivation of a single indicator or a restricted set of indicators measuring the major dimensions of the concept (Burke, 2004). There are several methods for inequality measurement. The Z-Score additive model is an easy method for analysis of inequality and other related studies (Altman, 1968; Burke *et al.*, 2006b). The derivation of selected variables involves the transformation of data on individual variables into some kind of standard scores. This can be achieved in various ways including conversion into ranking and the standardization of the ranges, but the most common method is to use Z-Score. For observation 'i' on any variable, the Standard Score (Z_i) is given by:

$$Z_i = \frac{X_i - \bar{X}}{S}$$

Where:

X_i is the value for observation (i)

$$X_i = X - X_s$$

- X Is the value of variables which have been formulated for the study.
- X_s Is the specific standard for each variable in the study area (i.e. the highest value of the variable).
- \bar{X} Is the mean of the specific standards.

$$\bar{X} = \frac{\sum X_s}{n}$$

- n Is the number of observations.
- S Is the Standard Deviation.

$$S = \sqrt{\frac{\sum X_s - \bar{X}}{n - 1}}$$

This model has been applied in this study to measure inequalities of health and nutrition.

- Firstly, the data has been converted into percentages and units i.e. variables. Secondly, all selected variables have been arranged in descending order (X).
- Thirdly, highest value of each variable has been selected as specific standard for each variable in the study area (X_s).
- Fourthly, the specific standard for each variable has been subtracted from the value of variables formulated (X_i).
- Fifthly, the mean and standard deviation of the set of specific standards for the set of variables has been calculated.
- Finally, Standard Score (Z_j) has been calculated for each variable.

To remove negativity of Z_j the values have been squared.

The Standard Score Additive Model has been used to develop a Composite Health Indicator. The eight selected variables require the addition of the Z-Score for the individual variables taken to measure them. The model is thus:

$$I_j = \sum_{i=1}^K Z_{ij}$$

Where,

- I_j The magnitude of the indicator for the district 'j'
- Z_{ij} The standard score on variables (i) in the district 'j'
- 'K' The number of variables measuring the criterion in question

DISCUSSION

There are a number of empirical studies of how quality is linked to demand for public facilities (e.g. Akin *et al.*, 1995; Lavy and Germain, 1994; Lavy *et al.*, 1996; Mwabu *et al.*, 1993; Thomas *et al.*, 1996) and this literature is well reviewed by Alderman and Lavy (1996). Even though the measures of quality are not always satisfactory, the findings are that demand is responsive to quality in developed countries but is the reverse in developing countries.

Equality goals, such as equal treatment for equal need or equality of access, commonly take pride of place among the aims of health policy in developed countries but sadly lacking in developing countries (Grand, 1987). The analysis of human resources in the context of health sector appraisal studies will need to improve in depth, scope and quality by incorporating functional, institutional and policy dimensions (Martinez and Martineau, 1998).

First, too often the impact of PHC was calculated as if health status were entirely a technocratic affair and individuals were the passive recipients of government action. But individuals actively use their knowledge and resources to enhance their own and their children's health. Incorporating choices into the analysis can completely change both the expected impact of PHC and the ranking of the importance of various actions. The impact of PHC cannot be assessed from the medical viewpoint, but depends both on how it impacts on the demand for services and on how it interacts with the existing and potential supply and prices in the private sector.

Second, PHC advocates often assumed that as the public sector could be made to deliver whatever was decided in the capital (or at an international forum in someone else's capital) it ought to be delivered. In practice, the quality of public sector health services has ranged from excellent to truly horrific. While an idealized, well run network of community workers and rural health clinics might have a dramatic impact on health status, the real issue is the impact of the services a country's public sector is actually capable of providing. Public sector failures in health are not just random but are results of a systemic mismatch between the incentive structure in the traditional civil service mode of public sector organizations and tasks in the health sector.

A recent survey of a rural area of Punjab province, Pakistan, found that although the physical infrastructure of rural PHC was in place

“Only about 5% of the sick children were taken for treatment to primary health care facilities; half were taken to private dispensers and another quarter to

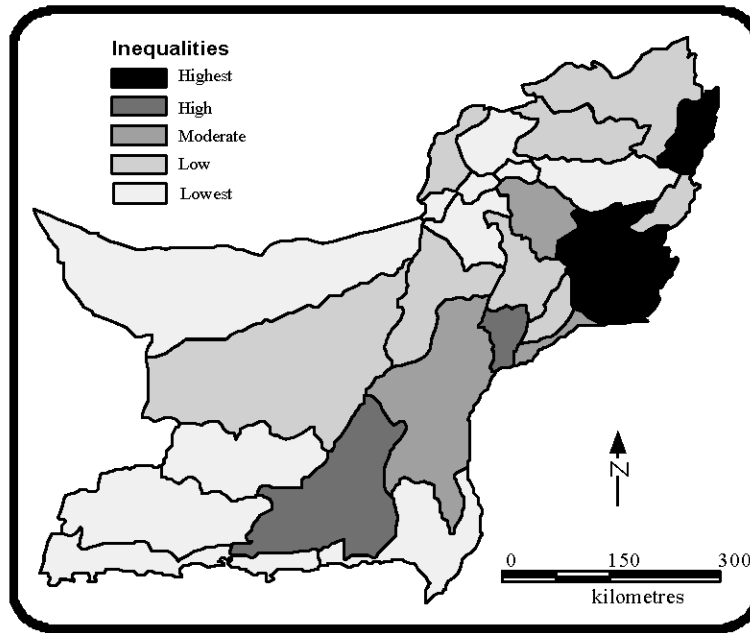


Fig. 2: Health inequalities-Balochistan 1998

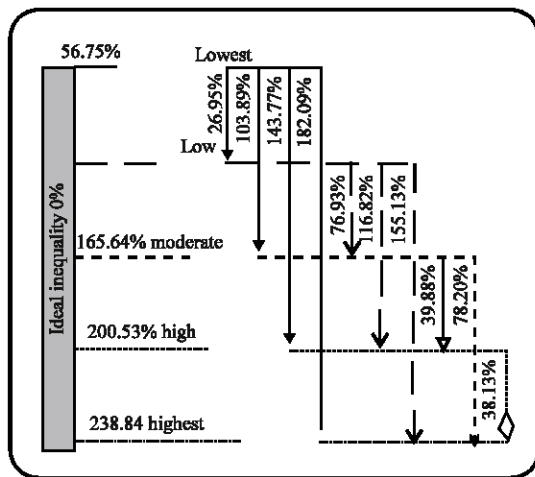


Fig. 3: Percentage variation of inequality of standard scores above ideal inequality in health-Balochistan 1998

private MBBS doctors. Around 95% of deliveries took place at home.” (PIEDR, 1994, p.vi).

Roughly the same percentage of respondents sought treatment from a public rural health facility (5.2%) or a “quack” (4.9%). This was not because individuals were deterred from public facilities because of queues. On the contrary, the typical rural health center

was seeing only about 30 patients a day and the typical “basic health center” only 11 patients a day which was far below capacity as rural health centers had on average 8 workers and basic health units five. Two atypically busy rural health centers attracted and serviced an average of over 450 visits per day (PIEDR, 1994).

The bulk of the population of Balochistan resides in rural areas where development of infrastructure is in a dismal state. A wide variety of health care options-home based, indigenous and cosmopolitan, exist in Balochistan. Especially in the area of mother-child health and in the presence of a pluralistic medical setting, precedence of local indigenous medication over advice of practitioners is more popular among the rural masses (Hunte and Sultana, 1992). This is solely because of the socio-economic backwardness of the area. Low literacy levels and extremely low purchasing capacity are factors mainly responsible for this behavior.

Developments in the health sector have been broadly explained by Z-score model. The various dimensions of health on the basis of selected variables reveal an appalling scenario. Figure 2 shows inequality in health sector. Highest inequality appears in the districts of Kohlu, Dera Bugti and Musa Khail. High level of inequality has emerged in Jhal Magsi and Awaran districts. A comparatively better situation appears in Khuzdar, Sibi and Nasirabad. Low inequality has emerged

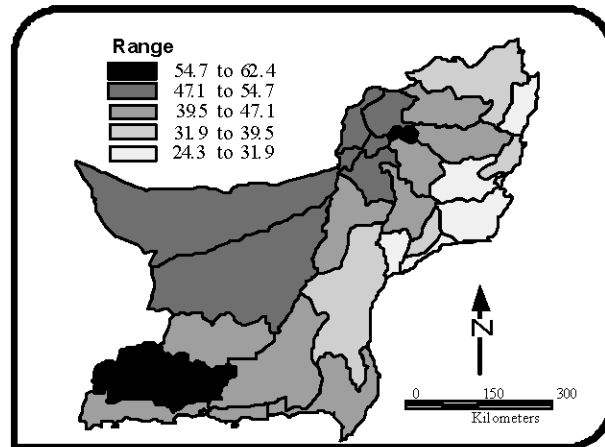


Fig. 4: Crude birth rate-Balochistan 1998

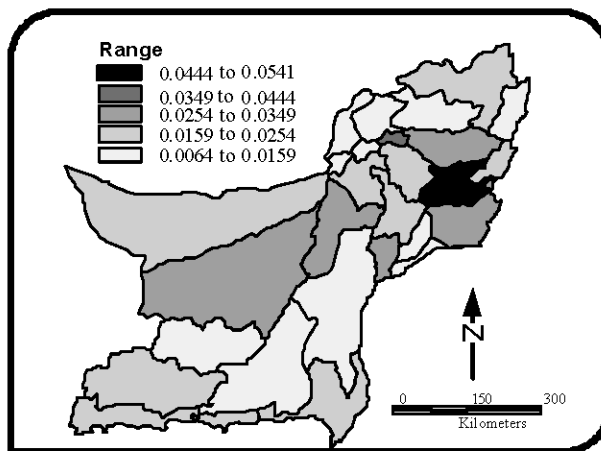


Fig. 5: Percentage of public health centers to total population-Balochistan 1998

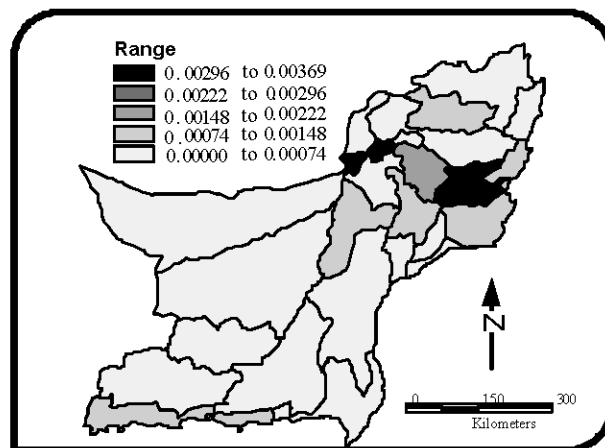


Fig. 6: Percentage of hospitals to total population Balochistan 1998

in Killa Saifullah, Jaffarabad, Bolan, Zhob, Barkhan, Killa Abdullah, Kalat and Kharan. Significant level of development in the health sector has been observed in Mastung, Loralai, Pishin, Gwadar, Panjgur, Chagai, Lasbela, Kech, Ziarat and Quetta.

Figure 3 shows the percentage variation of inequality of standard score to ideal condition (i.e. 0% inequality) for the districts of Balochistan, 1998. This graph reveals that remarkable disparities in health and health facilities exist in the study area. The districts falling in the group of lowest inequality category are 56.75% disparate, while highest inequality is 238.84% disparate from ideal condition and the magnitude of inequality from ideal condition between the two is 182.09%.

Figure 4-11 and their accompanying description depict the spatial variation of the selected variables accounting for the composite scenario shown in Fig. 2, so have been presented herewith.

Figure 4 shows that Ziarat has highest crude birth rate and Musa Khail lowest among all the districts of the province. The largest number of districts falls in the range of CBR 35-50.

As regards the position of PHCs to total population shown in Fig. 5, once again Ziarat has shown highest rank preceded by Sibi. Both are neighboring districts. Lowest values have emerged for Quetta, Nasirabad and Panjgur districts.

Figure 6 displaying percentage of hospitals for the total population of the province reveals that Musa Khail, Ziarat, Jhal Magsi and Awaran do not have appreciable facilities of hospitals for their population, while Quetta, preceded by Kohlu has shown significant number of hospitals.

Figure 7 reveals the facilities of hospitals and public health center beds to total population in the province. Quetta has shown outstanding result, where 0.38%

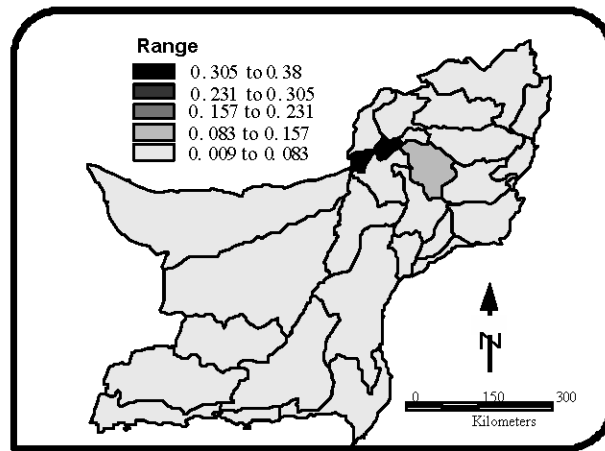


Fig. 7: Percentage of hospital-beds to total population-Balochistan 1998

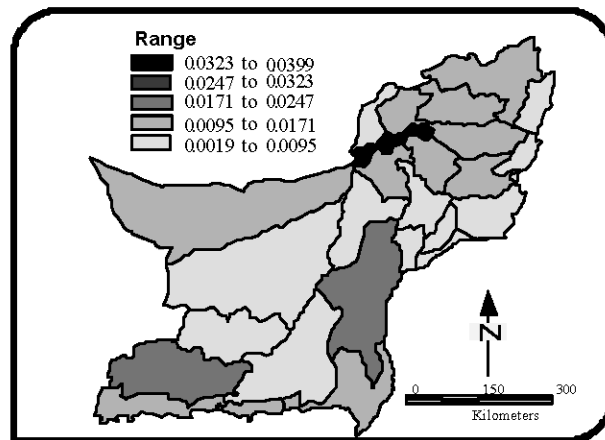


Fig. 8: Percentage of doctors to total population Balochistan 1998

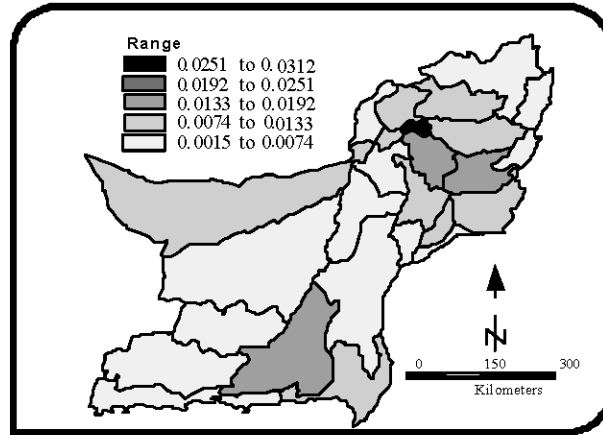


Fig. 9: Percentage of lady health workers to total female population-Balochistan 1998

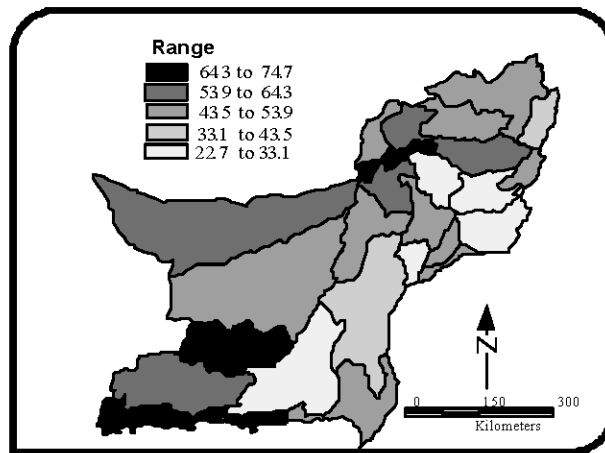


Fig. 10: Percentage of children immunized and vaccinated to total children less than 10 years-Balochistan 1998

persons have the service of 1 bed, Sibi 0.10%, while Ziarat 0.07, Loralai and Kohlu 0.05%, each. Lowest values for the variable have been found in the districts of Barkhan, Musa Khail, Panjgur, Awaran, Mustang, Khuzdar and Chagai.

Remarkable disparity appears in the variable on doctors to total population (Fig. 8). Quetta and Ziarat have emerged as districts with extra ordinary performance among the districts of the province while a dreadful situation has been observed in Musa Khail, Awaran and Jhal Magsi.

Figure 9 shows the spatial variation of the variable lady health workers to female population. Ziarat preceded by Sibi and Kohlu provide maximum health tips and health

care to its female population through lady health workers. Districts of Jhal Magsi, Khuzdar and Panjgur are lowest performing districts in this respect.

Quetta and Ziarat have shown deep interest in the eradication of Polio and other child diseases, where more than 70% children were recorded to have been vaccinated (Fig.10). Panjgur, Gwadar, Kech and Chagai show above 60% performance. Most of the districts show performance below 40% eg. Kohlu, Dera Bugti, Awaran, Jhal Magsi, Sibi, Musa Khail and Khuzdar.

Figure 11 reveals the spatial variation of variable Standard Nutrition Units. Ziarat has shown high performance on this account among the districts of the

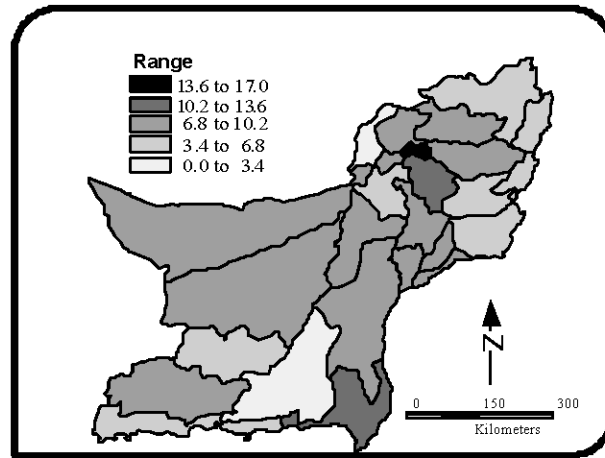


Fig. 11: Standard nutrition units (persons per annum) Balochistan 1998

province. Lasbela and Sibi are comparatively high performing districts, where values above 10 SNU per person per annum have been recorded. Awaran and Killa Abdullah do not have agricultural land fit for cultivation due to their surface configuration, therefore their backwardness in this respect.

CONCLUSION

The scenario that has emerged on the basis of selected variables reveals that Balochistan does not have a very heartening performance in terms of health. An in-depth observation has revealed that the health policies of the past were unbalanced and improper and implementation too was half hearted.

Most of the area is administratively controlled by 'Sardars' (i.e. feudal land lords of the area). All development depends on their approval whereby majority of health personnel avoid delivery of their services. The area is also very poor in infrastructural development. When the literacy level itself is low, production of quality health personnel is not possible; neither can they be produced in sufficient numbers.

Even a cursory glance at the history of planning in this area, in the post-independence era till date reveals that due to the dominance of the 'sardari nizam' in the province, it has not participated much in the country's decision making process. Another cause of its lagging position is its low population representation as a ratio of the country's population, as benefits accrue to the provinces in proportion to this count in Pakistan.

Quetta, by virtue of being the provincial capital has the maximum proportion of facilities available. The

surrounding districts of Ziarat, Pishin, Mastung and Killa Saifullah benefit from the capital because of their proximity, while the districts of Lasbela, Gwadar, Kech and Panjgur being far flung districts in addition to having 'sardari nizam' have very poor performance.

Programs of immunization and vaccination e.g. (Extended Program of Immunization) are frequently announced and even initiated but fail to give the desired results probably because of wariness by educated urban dwellers on the one hand and failure of the program to reach the isolated, interior, rural areas (except Ziarat) on the other, as well as the spread of rumors regarding the programs among the public in general.

Keeping the socio-cultural scenario in perspective, least unmindful of the prevailing dire economic conditions, a necessary prologue to any positive results desired to emanate from really sincere government policy formulation, to the earnest execution of the so called honest desires, is the provision of facilities firstly to improve literacy standard in the province. This will serve as a corollary to an educated province, as education is the building block of an enlightened nation. All else will follow suit.

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