Persistent Disease Outbreaks and Malnutrition in Tharparkar, Pakistan: Natural Disaster or Man-made Public Health Crisis?

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Abstract

Over the last decade, a humanitarian crisis has developed in Tharparkar, a largely rural district in the south of Pakistan that is increasingly inhospitable to human habitation.

A combination of food shortages, poor diet, a shortage of clean drinking water and inadequate hygiene has caused malnutrition and outbreaks of disease. This has led to the death of thousands of people – primarily newborn infants, pregnant mothers and young children – as well as livestock. While this is a land of restricted rainfall and limited natural resources, an emerging disaster been exacerbated by a dearth of basic infrastructure and deficient public health facilities.

By imposing bold strategic administration and economic investment to supplement short-term aid it may be possible to bring sustained relief to the people of this impoverished region, thereby averting the prospect of famine and diseases of poverty.

INTRODUCTION

Tharparkar is one of the most backward and impoverished districts of Sindh, the most southerly of the four provinces of Pakistan. Occupying an area of approximately 22,000 km² [1], 80% of which is rural [2], it has the lowest Human Development Index of all the 29 districts of Sindh. An estimated 1.5 million local residents are distributed among 2,300 registered and 2,000 unregistered villages [1,2]. This represents a population density of around 68 persons per km², generally considered to be low but in fact one of the most densely populated arid regions in the world [2]. Families of subsistence farmers eke out a living based on rain-dependent arable crops and animal husbandry.

Geographically, Tharparkar is a land of deserts, not supplied by any source of fresh water, and with restricted rainfall and limited natural resources. Near the ancient pilgrimage site of Nagarparkar there are two perennial springs, as well as temporary streams that flow during the rainy season in July and August. However, during summer months temperatures exceed 50°C when the loss of available water by evaporation is considerable [1,2].

A PUBLIC HEALTH CRISIS

Since 2010, persistent drought conditions and epidemics of various infectious diseases have turned the public health outlook of the region into a catastrophe. Outbreaks include water-borne diarrhoeal diseases, malaria, fevers of unknown origin, upper respiratory tract infections and scabies mite skin infestations [2,3]. Most recently, the district has been hit by an outbreak of the mosquito-transmitted viral disease, chikungunya, for which currently there is no vaccine to prevent or medicine to treat the infection [4]. Between April and September 2017, there were 646 confirmed cases. This is the first time that this often debilitating disease has been detected in Sindh, with Tharparkar the major affected district.

Food shortages and poor diet have resulted in malnutrition which has affected immensely child development [5]. According to one report from 2011 to the first half of 2016 over 1,500 children died from disease and malnutrition (Figure 1) [2]. Moreover, in December 2017 the respected daily newspaper Pakistan Today disclosed that six children had died of malnutrition in Tharparkar within 24 hours, reportedly bringing the death toll to 516 during the year [6].

Figure 1: Reported Children (less than 5 years of age) Deaths in Tharparkar due to Various Diseases and Malnutrition from 2011 to July 2016 [2].

Together with the impact on human health, the situation has affected considerably livestock and flora of the region. In 2014, 88% of households in Tharparkar had no income due to low and irregular rainfall, emphasizing the reliance on livestock [2]. In that year alone, several highly contagious animal disease outbreaks caused the loss of 300,000 livestock animals, principally donkeys, camels, goats, cow, sheep and mules [2]. Among the affected villages, 89% were afflicted by sheep pox, 78% by ovine rinderpest (peste des petits ruminants) [7], and 49% by anthrax [3]. Although they show some adaptation to living in a hot and arid environment these domesticated animals also commonly suffer from heat stress [8]. As of late February 2017 over 170 peacocks have died in an ongoing outbreak of Newcastle disease (known locally as ‘Ranikhet disease’) [9]. This is not the first time that this avian disease has affected Tharparkar. Since 2011 a number of outbreaks have resulted in the recorded death of hundreds of birds and the probable mortality of thousands more. The consequent impact caused to native wildlife is of considerable concern to the balance of the district’s ecosystem.
CAUSES OF THE CRISIS

The reasons for the adverse scenario observed in Tharparkar are multifactorial. Healthcare facilities are substandard and insufficient in coverage. Only three major hospitals and 32 basic health units cater for a population of considerably in excess of one million people [2]. Travel time to the nearest medical facility is between 2-4 hours with an associated travel expenditure ranging from PKR 1000-4000 (US$ 9.55-38.2) [10]. As the average monthly income is less than PKR 5000 [10], this cost is not readily affordable for the local residents.

Women’s health is neglected, a common issue in remote villages of Pakistan. The problems stem from cultural beliefs and a shortage of reproductive health facilities [11]. More than 80% of women in Tharparkar are anaemic [10], while with a mean weight of only 44.2 kg, 90% of adult females are underweight [2]. The teenage pregnancy rate in the region is the highest in Pakistan, girls getting married as young as 12 years of age [2].

Collectively, factors such as under age and frequent pregnancies, mothers’ malnutrition, tainted water [12], and inadequate sanitation often result in poor child health. It is estimated that 80% of newborn infants are underweight [2]. The mean birth weight is 1.1-1.2 kg, significantly below the national norm of 2.5-3.0 kg [10]. The maternal death rate is as high as 320 in every 1000 pregnancies [13]. There is an extreme shortage of medical expertise, be it physicians, nurses or specialist healthcare personnel. Only 14% of deliveries are served by skilled birth attendants or trained midwives [2]. Among the 300-400 children admitted to hospital each month, due to a lack of appropriate facilities and/or personnel 15-20% die due to various eminently treatable diseases or disorders [2]. Currently, there are only six qualified paediatricians to cover over 500,000 children [2].

Livestock is harnessed as both a source of subsistence income and for transport. For an estimated stock of 4.6 million animals only 12 qualified veterinary surgeons are available [2]. Families reside in intimate proximity to their domesticated animals, sometimes co-habiting the same living room, which poses a serious threat of zoonotic disease transmission. The staple food stuff in Tharparkar comprises either jowar (maize) or bhajra (millet) [10]. Due to limited seasonal rainfall only one type of grain is grown annually; upon harvesting and storage this is consumed for the remainder of that year. The typical diet is markedly lacking in fruit and vegetables. As a consequence, people are deprived of vital vitamins and minerals, which can lead to malnutrition. In a 2014 survey, >19% of children showed signs of being either moderately or severely malnourished (Figure 2) [14].

Basic living amenities are very poorly supplied. The availability of electric supply is severely restricted, for example only 4.7% of all schools have electricity [2], while access to clean water is extremely limited. Due to the effect of 11 droughts during the past 30 years, 70% of Tharparkar’s population is without water that is safe to drink [10]. Women lead donkeys, mules or camels for several kilometres in the desert daily in order to fetch water for drinking, washing, cooking and household chores.

The literacy rate of both adults and children in Tharparkar is the lowest in Sindh. Overall literacy is about 20% while that of girls is only 6.9%, the lowest level nationally [2]. This figure is reflective of the extremely poor education provision. Of 4,000 registered schools, 90% remain closed due to an absence of qualified teachers [2]. This places a great onus on high quality verbal communication to stakeholders within local communities, for example, to deliver public information campaigns and to explain and
receive consent for immunization, for which trained interpreters may be required.

**CALL FOR ACTION**

The humanitarian crisis in Tharparkar highlighted here presents a picture of extreme misery. There is a pressing need for urgent attention at the levels of provincial and federal governments and non-governmental organizations. Health-monitoring bodies such as the World Health Organization (WHO) and the United Nations International Children’s Emergency Fund (UNICEF) are urged to consider the matter seriously. While the situation will not change overnight, the prompt implementation of appropriate treatment and control measures can tackle the crisis effectively.

The Government of Sindh should address the paucity of specialist physicians (especially gynaecologists and paediatricians), veterinary-arians, skilled birth attendants, trained healthcare practitioners and qualified school teachers by recruiting and relocating staff to the region as a priority. Due to the prospect of enduring extreme weather conditions and material hardship most official staff posts are unfilled or incumbents do not report to perform their designated duties. However, provision of incentives and allowances is a feasible option to tackle difficulties in recruitment and retention. Increased immunization coverage of children and livestock should lessen the burden of disease outbreaks, as should improving sanitation. Tharparkar suffers from a lack of access to large urban hubs due to poor transport and communication systems. Mithi, the district’s capital, lies 450 km from Karachi, the capital city of Sindh. Establishment of new roads is crucial to facilitating travel to major hospitals and markets.

**CONCLUSIONS**

The plight of the population of Tharparkar, one of the most marginalised communities in Pakistan, is characterized by drought, severe malnutrition and infectious disease outbreaks. The determinants of this public health crisis are multifactorial, being both natural and made. Unfavourable environmental conditions and climate change in the region over the last decade have been exacerbated by a poor agricultural system and an absence of elementary infrastructure. In turn, this has placed an untenable burden on what are inadequate healthcare facilities. In terms of measures to improve public health in Tharparkar, long-term sustainable actions to address the wider determinants of public health in the community may be as important as the current immediacy of strengthening all levels of health care services. Enterprises should be preventive and not just curative. This unfolding humanitarian crisis deserves an urgent and coordinated response involving all relevant global, national and local organisations.

**AUTHORS’ CONTRIBUTIONS**

Both authors have made substantial contributions to the conception of the article, contributed significantly to writing the manuscript, revised it critically for important intellectual content, approved its final version and agreed to its submission.

**CONFLICT OF INTEREST**

Authors have declared that no competing interests exist.

**REFERENCES**


