

## Indicators of child health in pastoral communities in the Karakoram and Hindukush mountains, Pakistan

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### Abstract

Pastoralism is practiced in remote parts of the Karakoram and Hindukush high mountains, which sprawl across Northern Pakistan, with women and children travelling to high pastures with their animals during summer. The pastures are not accessible by road, while glaciers and hazardous terrain accentuate their remoteness. A cross-sectional observational study was carried out along Pakistan's border with Afghanistan's Wakhan province to assess health indicators in children in pastoral communities. A questionnaire was used to collect basic health data; height / length, and weight were also measured. Thirty-five children were included in the study. This paper offers preliminary conclusions about health indicators and access to health care facilities. For children in the pastures, health care, and other amenities entail long and sometimes hazardous journeys. Living at high altitudes with their livestock, food consists almost exclusively of wheat (roti) and dairy products. The most significant finding was severe stunting in 34.2% of the children. This is higher as compared to the national data, and from Gilgit-Baltistan.

**Keywords:** Pakistan, children, mountains, nutrition, health

**DOI:** <https://doi.org/10.47391/JPMA.1306>

### Introduction

Consider a ubiquitous daily household activity among pastoral communities in northern Pakistan, and the laborious stirring of milk over low heat. Dairy products are a central part of the daily diet of northern Pakistani pastoralists, as cheese and butter can be stored for long periods without spoiling; moreover, they are dense, and travel well.<sup>1</sup> Yet, as this research shows, the predominance of dairy products in children's diet may have a deleterious effect on their health.

This study examines basic health indicators in four pastoral communities, a segment of Pakistan's rural society that is further marginalised by its geographic remoteness.

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The Karakoram and the Hindukush mountain ranges sprawl across northern Pakistan's administrative region of Gilgit-Baltistan, and Chitral district in Khyber-Pakhtunkhwa province. Although the majority of Gilgit-Baltistan's population lives in proximity to roads, many continue to rely on pastoralism, underscoring the role of livestock — goats, sheep, yak — in household food intake and the diversification of household livelihoods.<sup>2</sup> Pastoralists, including children, spend part of the year in grasslands at heights of between 3,000 and 4,700 metres located many days' walk from the road.<sup>3</sup>

Of the two largest pasture areas in Pakistan, one is in Shimshal, in northern Hunza, and the other along Pakistan's border with Afghanistan's Wakhan province. This study was conducted in the latter.

### Methods and Results

This study was conducted in June 2015, travelling on foot between four pastures: Piyakhin [3,259m], Waraghut [3,348m], and Sokhter Rabot [3,454m] in Gilgit-Baltistan, and Shuarsher [3,750m] in Chitral district, Khyber-Pakhtunkhwa. Access required traversing hazardous mountain terrain over several days.

A questionnaire was used to collect information, which included demographic data, and specific questions about nutrition and basic health. Approval for the study was obtained from the Research and Ethics board of the CMH Lahore Medical College. Verbal consent was obtained from the children's parents; 10 children whose parents refused to give consent were not included. Interviews were conducted in Urdu; a local assisted where only local Wakhi language is spoken. A basic physical examination of the participating children was conducted. The total available population was selected; all children in the pastures were invited to be part of the study. Total population of the pastoralists is unknown and varies over time.

**Demographics:** The study included 35 children, aged six months to nine years, who were accompanying their families to the summer grazing locales. During the rest of the year, the same families practice mountain agriculture at lower altitudes. Ethnically, 19 (54%) of the children were identified as Wakhi, 9 (26%) Gujjar, and 7 (20%) Kyrgyz. Children in Piyakhin — at lowest altitude and closest to the

road — attended school in Piyakhin. There was no functioning school at Waraghut or Sokhter Rabot; the children did not receive formal education in the pasture, and only attended school when they descended to lower altitudes to their permanent homes. In Shuarsher, children over eight years attended school which is an hour's walk away.

**Health Indicators:** Children were born at home. Initial feed varied; while colostrum and breast milk was fed, for many respondents, milk and ghee (clarified butter) were the first feeds. Breastfeeding duration varied: some children were breastfed for two years, while others switched to animal milk at 40 days of age. Weaning with solids started at about six months. The diet of slightly older children consisted of milk, butter, cheese, and roti (baked flatbread made from wheat). While vegetable farming was practiced in Piyakhin, there was no access to fruit or vegetables in other pastures.

The data demonstrates stunting in 10 (28.5%) children, and severe stunting in 12 (34.2%). Stunting is height for age > 2 Standard Deviations (SD) or < -2 z-scores on standard World Health Organisation (WHO) height for age graphs; severe stunting is less than 3SD or < -3 z-scores. Six (17%) children were identified as underweight, while 5 (14.2%) were severely underweight. Underweight is defined as weight for age > 2 SD or < -2 z-scores on standard WHO weight for age graphs; severely underweight is > 3SD or < -3 z-scores.

Dental caries, eczema, anaemia, and hair lice were frequently observed.

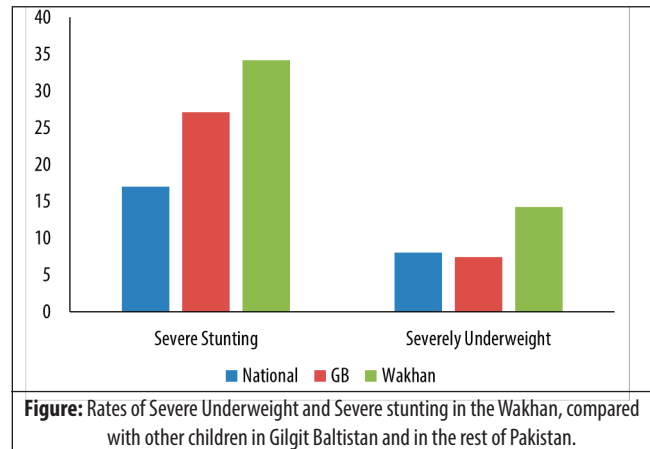
The closest health centre could be reached in two to three days, depending on the location of the pasture, condition of the trail, severity of illness, and availability of transport on reaching the road.

## Discussion

This article began with the description of a typical pastoral activity in northern Pakistan: processing fresh milk into yoghurt and hard cheese. The high percentage of underweight children and stunting in this data suggests that over reliance on dairy may not provide adequate calories.

Seventeen percent of the children were underweight, and 14.2% were severely underweight. The number of severely underweight children is almost double than that of the national average (23% underweight; 8% severely underweight); it is also more than the average for Gilgit-Baltistan, where 18.2% children are underweight, and 7.4% severely underweight.<sup>5</sup>

Stunting was observed in 28.5%, and severe stunting in



34.2%. The results for stunting were better than the national average of 38%, but severe stunting was significantly more than the countrywide average of 17%. There is only 27.1% severe stunting in Gilgit-Baltistan, albeit 47.2% stunting.<sup>5</sup>

Nationally, children living in rural areas are more affected by low weight and stunting.<sup>5</sup> According to the United Nations' definition, pastoralists would be classified as rural, with a lower 'standard of living' and less access to services compared to city dwellers.<sup>6</sup>

The Figure demonstrates the higher rates of severe stunting and severe underweight in pastoral children as compared to other children in Gilgit-Baltistan, and in the rest of the country.

UNICEF lists Pakistan as having the third highest percentage of stunted children.<sup>7</sup> Maternal and childhood nutrition falls short of international standards of minimal optimal nutrition,<sup>8</sup> which include initiation of breastfeeding within one hour of birth, exclusive breastfeeding until six months of age, and introduction of solids at six months with appropriate varied complimentary food, with breastfeeding to continue until two years of age.<sup>9</sup> Potentially irreversible short stature, and suboptimal intellectual development, can contribute to a decrease in national productivity.<sup>5,7,10</sup> Stunting in females can lead to decrease in fertility, and stunted children.<sup>11</sup>

Previous studies have approached children's health in northern Pakistan with the focus on factors contributing to mortality: diarrhoea, pneumonia and other childhood illnesses, and access to clean drinking water and improving sanitation.<sup>12</sup> However, these studies were carried out in communities serviced by a road.

This present study shows that diet amongst pastoral communities did not meet sufficient nutritional needs of the children; except for the permanent Kyrgyz settlement

at Piyakhin where vegetables were grown, the diet in other settlements was wheat in the form of rotis (one to three per child daily), dairy (milk, ghee, cheese) and occasionally, small quantities of meat. Breastfeeding was practiced inadequately, and complimentary foods fell short of a varied and balanced diet. Living in the pasture — and having a pastoral diet — is to children's disadvantage. Survival on the marginalised ecosystem of pastures is a challenge. Although there is some potato farming at an altitude of around 3,000m, at higher altitude it is impossible to grow produce in the Karakoram and Hindukush mountains' harsh terrain. Pastoralists rely almost exclusively on food they can carry with them, during their months of pastoral life. In this case, this includes wheat and dairy from their livestock.

Besides lice, eczema and dental caries, the children were in good health, and had no serious medical condition. Reliance on commercial pharmaceuticals instead of traditional cures was surprising but indicative of commercial penetration in towns and villages where pastoralists spent part of the year. Schooling, although not consistent, was described as important for children's future. Increased mobility emphasised the importance of education.

### Limitation

In this study the sample size was not calculated because a pastoral population was under study. By definition, a pastoral population is mobile, as a result of which the number of people in a given pasture is changing all the time. All children available in the pastures were invited to be part of the study.

### Conclusion

This paper highlights the health of pastoral children in Pakistan's Karakoram and Hindukush high mountains. It documents the lives of children in pastoral communities in northern Pakistan and gives an overview of the basic health indicators. Although the sample size was small, the data is illustrative of other pastures dotting the Karakoram and Hindukush. Low weight and stunting is a consequence of family's vocational activity leading to geographic marginalisation, and resultant suboptimal nutrition. This community deserves closer attention by the state health sector and NGOs.

**Disclaimer:** Although broad conclusions could be drawn, the results of the study are particular to observations made by the author at the time and places specified. The results of this study were presented as a paper at a conference, "Pakistan at 70", Lahore University of Management Sciences, April 2017, to a non-medical audience.

**Conflict of interest:** None.

**Funding disclosure:** None.

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