



punjab geographer

A JOURNAL OF THE ASSOCIATION OF
PUNJAB GEOGRAPHERS, INDIA

VOLUME 3

OCTOBER 2007



CHANGING DISEASE ECOLOGY OF LEH DISTRICT : CONTEMPORARY SCENARIO AND HISTORICAL PERSPECTIVE

Rais Akhtar

Abstract

In this paper an attempt has been made to present a comparative disease scenario between 1867 and 2001, and to highlight geographical explanation on the pattern of diseases in Leh district of Ladakh. The study is based on the primary as well as secondary sources of data and information.

Introduction

The town of Leh is located on an alluvial fan. To the east of Leh on either bank of Indus is an alluvial plain stretching over an area of about 30 square kilometers. This is the most fertile level land where several rural settlements of the Ladakh region are located. Although its physical isolation has prevented rapid change yet, the expansion of tourism due to disturbed conditions in Kashmir since 1990 has provided a lot of inputs for changing lifestyle of the people on the pattern of western style of development. Despite this contemporary influence, the culture of Ladakh which is historically closely linked to that of Tibet is generally well preserved. (Norboo, at. al. 1991)

Geo-ecology of Health

There is a strong linkage between geo-environmental conditions and an epidemiological scenario in Ladakh. The Indus valley in Ladakh is subject to periodic loess deposition derived by dust storms. For some years local doctors have been concerned at the frequency of chest diseases in some villages of the Indus valley in Ladakh. Table 1 shows the number of cases of various diseases reported in Leh District.

Table 1
Leh District: Incidence of diseases
(up to July, 2000-01)

Disease	No. of cases
Respiratory Tract Infection(RTI)	11957
Dental	9123
Acute Diarrhoea	6828
Hyperacidity	3397
Ophthalmic cases(other than cataract)	2670
Skin problem	1861
ENT	1369
Hypertension	1042
Mumps	0333
T.B.	0073
Chicken pox	0076
Leprosy	0003
STD	0001

Source: Chief Medical Officer, Leh

Respiratory Tract Infection (R.T.I) is dominant health problem in the Leh region. The largest number of cases of respiratory illness were found in the village Chuchat Shamma which lies at an altitude of 3000 metres and almost 15 Kilometers from the town of Leh. This region lies in the rain shadow of the Himalayan range known as Ladakh ranges. RTI is followed by dental diseases, diarrhoeal

diseases, hyperacidity cases, ophthalmic and skin diseases. The geo-ecology of the health hazard in Leh must be understood in this regard. Major hazard to health in Leh is the transport and transformation from primary dust source (loess) to airborne dust to which local communities are exposed. The population is exposed to silica-rich particulates with a substantial respirable size fraction. Studies carried out in the region noted signs of pneumoconiosis in X-rays of some villagers in a region with no mines or dusty industries. Two important surveys of silicosis, carried out in the surrounding areas of Leh, found that, in one relatively highly exposed village, the prevalence reached up to 45 per cent in a random sample of 150 adults aged 30 and over, including cases of progressive massive fibrosis in the villages of Chuchat Shamma and Stok. The villages are exposed to frequent dust storms. Chest radiographs of villagers aged 50-62, examined showed varying grades of silicosis, compared with 3 of 13 men and 7 of 11 women in village Stok, which lies 300 metres higher and is exposed to fewer dust storms. The study concludes that the difference in prevalence of silicosis between the two villages was significant, as was the differences between men and women. The findings of the study support the evidence that silicosis may develop when people are exposed to desert dust. The study also suggests that silicosis is widespread among elder people exposed to environmental dust and that it may result in advanced fibrotic lung disease associated with disability. Women, who are more heavily exposed to dust in the course of their work, appear to be more commonly affected than men (Norboo, at. al. 1991). The investigations reveal that the reduction of exposure in this community would be difficult to achieve. This is because of the

fact that geo-ecology of the region, types of rocks/soils which are rich in silica and the frequency of dust storms will continue to affect the population in the Ladakh region. It is interesting to note that a different kind of dust storms causing havoc in northern China affecting the food production may lead to starvation and malnutrition. The *“gigantic dust clouds swirling over China are threatening the world's most populous country with the first- ever ecological meltdown, experts warn. The clouds – which stretch for thousands of miles over Asia and have even reached across the pacific to North America- are rising from a rapidly growing dust bowl in northern China that far out-strips the notorious one in the United States in the 1930s. The clouds sweep up millions of tons of precious topsoil from Chinese fields and pastures”* (Lean, 2003).

Climate Change Phenomenon

Although one of the most experienced physicians of Leh Dr. Norboo¹ suggests that the occurrence of dust storm, in this region of Ladakh is a regular phenomenon, and not an unusual thing for this region, yet the author of this paper could not find in the literature of geography and history of Ladakh, any example of the occurrence of dust storm in Ladakh. Most important example, that too by an American geographer-Ellsworth Huntington, who visited Kashmir and Ladakh in 1905, tells us about the ecology of Ladakh as under:

“Arid, inhospitable, and rugged as Ladakh may be, its clear air, bracing climate, and splendid scenery make the traveler long to return to it. The stony villages and ugly people have a peculiar charm” (Huntington, p 58). While traveling at Puski and Zanguya in Khirgiztan, Huntington does mention dust storms; *“There was nothing to look at except*

1. Personal Communication with Dr. T. Narboo, Leh. (June, 2003)

pebbles, wonderfully smoothed and faceted by wind-blown sand, or dense columns of whirling dust, thirty or forty feet in diameter at the base and rising to a height of hundreds or thousands of feet, where they spread out after the manner of thunder clouds. Twice I counted between twenty and thirty dust-whirls visible at one time, and there were always at least eight or ten. It was evident that, even if there were no wind, the air in summer would be full of dust continually" (Huntington, pp.148-49). The above discussion suggests that dust storms in the Ladakh region are a recent phenomenon. There is good scope to investigate the phenomenon of climatic change and its impact on the occurrence of dust storms due to which the respiratory diseases are wide spread in this region.

Socio- Economic Impact

Based on the survey carried out by the author in the villages around Leh, it was noted that environmental dust has not only caused health problems, but also influenced the socio-economic characteristics of the region. As a result the women who have silicosis hardly reach the age of 50 years. Therefore, the boys from out side of this region (Chuchat, Stakna, Thikse and Shey villages) do not prefer to marry girls from these villages, because of high prevalence of silicosis. Besides, "*women, who are more heavily exposed to dust in course of their work, appear to be more commonly affected than men*" (Norboo, at al. 1991). The region is endemic for silicosis. The yield of various crops such as wheat, barley, peas and vegetables has declined. Although it has not been studied so far but a trace element pathway analysis might throw light if there is any link between the silica content in the soils and food grown on such soils and the resultant impact on health since, "*environment deficiencies or overloads of trace elements are mediated*

through the consumption of drinking water and locally grown food-stuffs, reflecting customary dietary patterns" (Akhtar, 1991).

In view of the seriousness of the environmental hazards in the region, some researchers have suggested shifting of these villages from this endemic region because, this region is prone to the high wind velocity.

The high frequency of wind that blows here causes soil erosion and environment dust pollution. The problem of environmental dust has also been aggravated after the construction of the road and by the passing vehicles on the road. This is an area dominated by Muslim population and they are also heavy smokers. It is just not understandable as to why in such a silicosis prone area two stone crushers and one cement factory were established. Several demonstrations were also held against the construction of the road. Efforts are being made to popularize the smokeless stove, and the use of mask against dust among the population in the region.

Changing Disease Ecology: Historical Perspective

In a quest to understand the disease ecology of Ladakh during the later part of nineteenth century, the author found out in the Wellcome Library, London, one short paper entitled, "*Notes on Ladkah-1967*" written by Assistant-Surgeon Henry Cayley, in 1868 for *Indian Medical Gazette*. This paper, apart from discussing the pattern of diseases in Ladakh (Leh and surrounding villages), also highlights the politics of health care availability in Ladakh. There used to be an active opposition of the introduction of western medicine by a *Hakim (Unani practitioner)* from Kashmir, the Kashmiri officials of Maharaja in Ladakh would secretly place hurdles before patients leading to decline in patient attendance at the allopathic dispensary Cayley writes:

“ owing to the obstruction secretly thrown in the way by the Cashmere officials, the attendance almost ceased; but after a short time I managed to put a stop to all active opposition, and the attendance of sick of all classes, both from Leh and its neighbourhood, and from distant places, at once revived at the same time an opposition dispensary was opened under the charge of a Hakim from Kashmir, and for a time the patients on their way to me were forcibly stopped and taken there for treatment, but as soon as this system was abandoned, the attendance at the Maharajah's Dispensary entirely ceased; for people of Ladakh do not believe that any good thing can come out of Cashmere” (Cayley, 1868). It is interesting to note that medicine was free from the western dispensary, however the Hakim and other indigenous “medicine men” (most

probably *Amchis*)² used to charge fee from the poor patients. There was a local saying about a Doctor:

*“When the care complete, he seeks his fee;
The Devil seems less terrible than he”*

Table 2 shows the diseases reported during July and August 1867 at the western dispensary. It is evident from the table that the disease pattern in Ladakh in 1867 was quite different than the contemporary disease scenario (Table 1). Fever, dyspepsia, ophthalmic, rheumatism, caries of teeth, syphilis were dominant diseases. Anaemia, scabies, hepatitis, frostbite, sinus and eczema were insignificant. Six cases of carcinoma were also reported. According to Cayley, fever appears to form a larger proportion of the sickness due to indigestion, cold, exposure to

Table 2
Leh: Incidence of diseases (July- August, 1867)

Diseases	No. of cases	Diseases	No. of cases
Fever	66	Constipation	2
Dyspepsia	61	Lepra	2
Ophthalmia	45	Anaemia	1
Rheumatism	38	Scabies	1
Caries of teeth	32	Hepatitis	1
Syphilis	25	Frostbite	1
Neuralgia	17	Sinus	1
Ulcer	16	Eczema	1
Bronchitis	16	Scrofula	1
Colic	10	Orchitis	3
Gonorrhoea	8	Dysentery	3
Cataract	7	Laryngitis	3
Scorbutus	7	Diarrhoea	2
Carcinoma	6	Cephaloea	3
Entropion	4	Fattytumours	2
Paralysis	4	Tonsillitis	2

Source: Cayley, H, 1868

2. *Amchi* is presently the most popular traditional (indigenous) system of medicine in Ladakh.

the skin whilst at work , standing in cold water etc. Cayley further adds that except in pilgrims and merchants, and others coming from the plains, no fever case similar to malarious fever was reported. Describing the favourable ecological condition for malaria, Cayley says- “... I hardly believe the disease to exist in spite of the whole of the land in the villages being almost constantly under water and exposed to a powerful sun”(Cayley , 1868).

Arthur Neve's Description of Socio-economic Ecology of Ladakh

In his letter to the Christian Missionary Society, Arther Neve (1898) described the sufferings of Ladakhi people due to cataract, difficult physical accessibility and the difficult conditions under which Neve carried out operations while holidaying in the Ladakh region in 1898.

He further writes “in some of the villages I was able to stop and treat the sick, extracting a few cataracts, as these people would never have a chance of going to hospital, though I tried to persuade some to go to Leh, where there is a surgeon of the Moravian Mission. But with a pass 17000 feet high to cross, these poor blind people could not go. I met indeed one man, a Buddhist priest, who had gone in 1896 and received sight at the hand of one of us, but as a priest he had special facilities for traveling but who would help blind women over the pass, and procure yaks for them to ride on.

Once when it was dusk, in a village in Ladakh, beyond the swift bridgeless Shyok, three poor creatures arrived in my camp. At first I refused to operate and told them to go to Leh. We were to start long before day break and cross the river by ferry, then do a long march up the mountain, but their importunity prevailed, and I said if they would be at the river I would see what could be done. At down it was both

windy and rainy. At the ferry these poor women had slept with no food but a little raw dough. We got into the boat and were swiftly swept down among the leaping wave, and landed a quarter of a mile down the other side. The ferry boat returned for the rest of our party. I had my box of instruments, but how I sterilize them and how should I light a fire?

I told the Ladakhis and they tried to strike sparks with flint and steel but the tinder seemed moist. One of them then produced a little gunpowder and placed it on a stone, tore off a rag from his shirt and fraying it out laid it by the powder, then with flint and steel ignited it. Then a cooking pot was produced and soon water was boiling. What an anachronism between the aseptic surgery aimed at and the primeval method of fire production! While the instruments were being boiled I cleaned the eyes and instilled cocaine, then kneeling in the sand removed the three cataracts, completing the operations, just before a gust of wind came. Laden with dust and grit, which would have put a stop to my work. The gratitude of the people knew no bounds” (Neve, 1898). This quote clearly shows the difficult circumstances physical, socio-economic and cultural which place number of hindrances in providing medical care by missionary doctors.

Diarrhoea and dysentery are almost unknown. Many a case of diarrhoea and dysentery were reported by people coming from Kashmir and Kullu now in Himachal Pradesh. Thus, it seems that the production of contamination of water was almost negligible. Similarly cholera according to Cayley, “has not reached Ladakh, though this year it has been raging in Cashmere, and come very close to the frontier; but it never surmounted the pass between the two countries; and as there was constant intercommunication, I can only suppose that the poison of the disease can not produce its effects at an altitude of 10,000 feet

above the sea" (Cayley, 1868). The statement provides a scenario of the process of cholera diffusion and difficult physical barrier of Zojila pass between Kashmir and Ladakh which hindered the diffusion of cholera wave from Kashmir. It is significant to note that Cayley referred cholera as poison of the disease. It would not be out of context to mention that in 1849 John Snow published a small pamphlet "*on the mode of communication of cholera*" where he proposed that the "*Cholera Poison*" reproduced in the human body and was spread through the contamination of food and water. It seems Cayley was very well aware about John Snow's work.

Conclusion

The study of changing scenario of disease ecology in Ladakh throws light on the pattern of socio-economic and cultural practices in relation to the occurrence of disease in Ladakh, that have ravaged the population during the middle of nineteenth century, and those which occur at present. The paper emphasizes the role of climatic change in causing dust storms leading to the higher incidence of chest diseases as a result of Respiratory Tract Infection. The diseases related to environmental dust is a continuous problem in this region of Asia. The reduction of dust exposure in this community would be difficult to achieve. This emphasizes the need to prevent respiratory diseases caused by other factors, such as cigarette smoking and smoke

pollution from fires in the home. A more intensive study should be carried out on this aspect.

References

- Akhtar, R. and Hunter, J.M. (1991): "The Challenge of Medical Geography", in R. Akhtar (Ed.) *Environment and Health: Themes in Medical Geography*, APH, New Delhi, p.30.
- Cayley, H.(1868): "Notes on Ladakh in 1867", *Indian Medical Gazette*, January 1, p.3
- Huntington, E (1907): *The Pulse of Asia: A Journey in the Central Asia*, Houghton, Mifflin, Boston
- Lean, Geoffrey (2003): "Huge dust cloud threatens Asia", *Independent Sunday*, 26th January, London.
- Neve, Arthur, (1898): "Christian Medical Missionary" *Annual Letters*, University of Birmingham Archives, p.14
- Norboo, T. et. al. (1991): "Domestic Pollution and Respiratory Illness in a Himalayan Village", *International Journal of Epidemiology*, Vol. 20, No. 3, p.749

Dr. Rais Akhtar
National Fellow
Center for the Study of Regional
Development,
School of Social Sciences,
Jawaharlal Nehru University,
New Delhi 110 067