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ABSTRACT

HIMALAYAN OLDER ADULTS' VIEWS ON INDIGENOUS MEDICINE: USES, AVAILABILITY, AND EFFECTS ON HEALTH AND WELL-BEING

by

Senjooti Roy

India is home to numerous medical traditions; almost 70% of its population relies on herbal, traditional, and/or folk medicine for basic healthcare needs. A fairly large proportion of this population comprises older adults who live in rural areas such as remote villages in the Indian Himalayas. Consequently, significant changes affecting any of these medical systems is likely to impact older adults more acutely than younger generations. A qualitative study using ethnographic data collection techniques was undertaken in three villages in a northern Indian state to understand the role of herbal, traditional, and folk medicines in the lives of older adults who are the primary users, practitioners, and custodians of local, traditional medical knowledge. The results have been contextualized in two time periods – "In the olden days…" and "These days…" to highlight the contrasts that older residents have witnessed in the nature, cause, and treatment of illnesses over time. Major themes in the time period "In the olden days…" include: pure food, pure environment, physical ability, traditional medical/non-medical knowledge, folk systems, and community support. Major themes in the time period "These days…" include: modern conveniences, migration of younger generations, climate change/environmental degradation, unsustainable harvest of herbs, changes in food systems, and decline in physical abilities. All of these together answer how older adults view and address "small illnesses", "big illnesses", "new illnesses" and "illnesses of old age" in the two time periods. This study highlights the relationship between the health seeking behavior of older adults and the evolving nature of various factors including trade, development, environment, socio-cultural norms, lifestyles, and family structures in the region.

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Dedication

To my parents

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Chapter 1: Introduction

1.1 Introduction

This chapter presents an overview of the study. It provides a background and context to help understand why it is a timely exploration of interdisciplinary concerns surrounding the lives of older adults in the Indian Himalayan Region (IHR). Further, it discusses the primary research questions that have guided the study design. Finally, it lists and defines key terminologies used throughout the document.

1.2 Background and Context

On the surface, India may seem like a country with a young population with a median age of 27.9 years and only 6.24% of its population over the age of 65 years. However, in actual numbers, the 6.24% translates into a population of over 81 million individuals who form the senior-most age group in the country (CIA, 2018). These individuals occupy various social strata; their lives, lifestyles, socio-cultural norms, and access to resources are determined by their social and geographical location. A major aspect of older adults' lives includes access to healthcare services, and India provides many choices to the country's residents. Depending on where people reside, their levels of educational attainment, the availability of financial resources, and their socio-cultural norms, millions of older adults turn to herbal (H), traditional (T), folk (F) or modern (M) medicine for their healthcare needs (see Table 1 for definitions).

The IHR features a broad range of geographic terrains and climatic conditions that support extremely diverse ecosystems comprising thousands of medicinal plant species that are the predominant source of healthcare for local rural populations. Older adults are the primary users, practitioners, and custodians of local, traditional forms of medicine and medical knowledge. Many of them lacked access to modern medical services in the past and were entirely dependent on H/T/F treatments for good health and well-being. Today, some people have gained access to modern medical services, whereas others continue to be dependent on H/T/F healthcare. Additionally, many older adults' food, nutrition, health, and income security are closely tied to the availability and use of local medicinal plants. Older adults also form the largest "permanent resident" population of the region as they are least likely to relocate to urban towns in search of jobs and alternate livelihood options. Consequently, they are the ones who are most impacted when the natural resources that form the foundation of their lives are threatened in any way.

This study primarily set out to explore the use of herbal medicine among older adults. Herbal medicine is dependent on the availability of local medicinal herbs to treat different types of illnesses, and is one of the pillars of healthcare in rural IHR. When the availability of herbs is threatened in any way, the health security of older adults is greatly affected.

The medicinal wealth of the IHR is under tremendous pressure for a variety of reasons. Foremost among them are the direct and indirect impacts of environmental change. As there is little that the older population can do to control or combat this phenomenon, they are forced to accept and adapt to the irreversible damage being inflicted upon their natural environment, their ways of life, and their deeply-rooted socio-cultural traditions. Due to unprecedented changes in their lives and surroundings, older adults in the IHR are also increasingly at risk of contracting unfamiliar illnesses for which they do not have H/T/F treatments and/or easy access to modern medicine. Medicinal plants - their trusted source of healthcare - are becoming less abundantly available; domestic cultivation of medicinal plants for food and healthcare is becoming difficult due to droughts, erratic rainfall, higher temperatures, and pest attacks; and natural disasters have exacerbated health problems while reducing the availability of natural healthcare resources. Most unfortunate, however, is that while people in remote, rural regions of the IHR suffer the most due to ecological upheavals, they contribute the least to local environmental alterations.

Environmental change is closely linked with social change. Therefore, in addition to risking losing a number of pillars that hold their communities together – forests, cattle, medicinal plants, agriculture, seasonal festivals, and cultural rituals – older adults are now also grappling with changes to family structures and living arrangements. With the migration of younger populations to urban locations, family structures are gradually evolving from that of "joint families" to nuclear families (a joint family is the cohabitation of three or more generations, usually grandparents, parents, and children under the same roof. This is different from "extended families" that may also include uncles, aunts, and cousins). Sometimes, young children are left with grandparents while the parents work in cities, thereby creating "grand-families". Living arrangements such as these are different from what older adults traditionally experienced in their younger years when several generations within families lived together and shared resources. The preservation and transmission of traditional knowledge that binds generations together is another major aspect of older adults' lives and heritage that is at stake. As younger generations move away from home, they are deprived of the opportunity to acquire traditional knowledge and skills

that can only be transferred orally or experientially. All of these are fairly new experiences for the older population. This means that while they are still exploring and assimilating their vulnerabilities, they have not had the time or the opportunity to develop adaptation mechanisms and strategies.

This study explores the challenges and struggles that older adults in three villages in the IHR are experiencing in current times. Environmental change, although a global phenomenon, impacts some people more adversely than others because some people have fewer means and resources to cope with such changes than others. Older adults in the IHR are one such population. Similarly, large scale social, material, and infrastructural changes, often aimed at the overall betterment of society, may sometimes negatively impact people rather than benefit them, and older adults in the IHR are one such segment of the population. This study, therefore, seeks to understand what the burden of change on multiple fronts means to people who shoulder disproportionately heavier loads of forced adaptation and adjustment. Specifically, this study looks at how various phenomena impact the availability and use of medicinal plants in the IHR, and how this in turn impacts the health status, healthcare options, and health-seeking behaviors of older adults. Additionally, this study explores the socio-cultural dimensions of health and illness among older adults in three villages in the IHR.

This study is grounded in interdisciplinary concerns within the broader scope of gerontology, including environmental sustainability, economic development, indigenous knowledge, Himalayan studies, public health, social science, and aging research. This type of qualitative exploration of environmental and social impacts on communities in the IHR is still a rarity in interdisciplinary academic research. Most such data gathering is done by Non-Governmental Organizations (NGO), advocacy organizations, and climate change initiatives of intergovernmental divisions and international development organizations. Academic research in the region is mostly performed in the fields of botany, taxonomy, climatology, glaciology, geophysics, and related disciplines. Very little has been undertaken by the social sciences, and even less so with older adults and within the purview of gerontology.

According to Nielsen & D'haen (2014), experts are increasingly proposing interdisciplinary and methodological collaboration in the field of environmental change research. However, "…poor communication on central aspects of research processes such as research design, theoretical framework and methodologies across particularly the qualitative-quantitative

divide has been argued to constitute a barrier for interdisciplinary cooperation in global environmental change research" (p. 402). The authors cite different epistemologies, theories of knowledge, understanding of what constitutes knowledge, and the production and communication of disciplinary knowledge as some issues of dissent. In the case of methodology, there is little consensus between quantitative and qualitative methods as the use of these are not equally understood, accepted, and valued across disciplines.

Quantitative research has already made some inroads into environmental change research in the Himalayas, but rigorous qualitative research is yet to catch up. Considering the wide range of issues that Himalayan older adults are faced with, there is ample scope, as well as need, to undertake qualitative research, explore and adapt methodological boundaries, build theories, and collaborate with different disciplines to delve into the lives and minds of those who are and will be worst hit by the realities of large-scale environmental and social change.

One of the larger goals of this study, therefore, is to include the voices of older adults to strengthen the body of interdisciplinary literature that is so far limited to scientific findings and evidence presented by experts. Qualitative research methods are well suited for this purpose as ethnographic data collection strategies comprising participant observation, group interviews/conversations, and key informant interviews allow for collection of in-depth data. Another goal of the study is to broaden the scope of gerontological literature in India where much focus and attention is diverted towards other more pressing social issues. This study uses a gerontological lens – a bio-psycho-social, interdisciplinary perspective - to explore the experience of aging amidst large-scale environmental and social change in the IHR.

1.3 Research Questions

This study aims to understand the aspect of change and evolution over time - in the description/definition of illnesses commonly experienced in old age, in the treatments of such illnesses, and in the availability of medicinal plants that support the herbal healthcare system of the region. The research questions that this study addresses are:

1. What health conditions, disabilities, physical or cognitive decline are associated with old age and how have their descriptions changed in the last three to four decades?
2. How have treatments for such diseases changed over time?
    i. What led to the changes?

ii. How have the changes affected the lives of the participants, their families, and their friends?

3. How do the participants perceive the changes in the availability of medicinal plant species?

    i. To what do they attribute the changes? Why?

The insight gained from this study will help to understand how people interact with multiple healthcare systems in current times, factors that effect changes in people's perceptions of health and illness, and the role of changing environmental and social realities in shaping people's health-seeking behaviors and healthcare decisions. The study will shed light on the experiences of a population that is rarely studied. It may also help to generate interest and open up avenues for collaboration in academic research of such populations.

1.4 Key Terms and Definitions

Table 1. Key Terms and Definitions

Terminology	**Definition**
Climate change	The Intergovernmental Panel on Climate Change (IPCC) defines climate change as: "a change in the state of the climate that can be identified (e.g., using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. It refers to any change in climate over time, whether due to natural variability or as a result of human activity" (IPCC, 2007). The United Nations Framework Convention on Climate Change (UNFCCC) defines climate change as: "climate change refers to a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods." (UNFCC, 2011).
Environmental change	In this study, the term "environmental change" has been used to encompass impacts of climate change as well as those resulting from other factors such as air and water pollution.
Folk medicine	Folk medicine is a non-scholarly traditional body of knowledge that evolves from trial and error approaches. It is a belief-based system that is passed on from one generation to another through unwritten means. There is no fixed or proven method to treat illnesses under this system; practitioners create and customize their own methods of treatment.

	Explanations regarding illness causation stem from dominant socio-cultural-religious beliefs; supernatural explanations are often used to treat and cure illnesses under this system (Dunn, 1976; Chahal, Kunkel, Subedi, Subedi, & Whittington, 2014). In this study, "folk medicine" refers to magico-religious healing rituals.
Herbal medicine	Herbal medicine refers to the medicinal and therapeutic use of plants for healthcare needs. Herbal medicine may make use of all or part of a plant; be consumed alone or in combination with another plant; and be used in various ways to address healthcare needs. It is commonly practiced in individual households; herbal medical knowledge is passed down from one generation to another through informal means. This system of medicine is dependent upon the availability of herbs either through natural growth and regeneration in jungles, or through domestic cultivation. Herbs may also be purchased from markets (WHO, 2017). Herbal medicine is generally considered part of folk medicine, however, in this study, it is mentioned separately to denote the self-use of herbs among participants rather than upon the recommendation of an herbalist.
Indian Himalayan Region (IHR)	The IHR spans ten Indian states in the northern, north-western, and north-eastern parts of the country (ENVIS Center on Himalayan Ecology, 2014).
Modern medicine	Modern medicine, also called Western medicine, biomedicine, evidence-based medicine and English medicine, refers to allopathic medicine. It denotes medical treatments based on rational ideas, natural causes (as opposed to supernatural causes), and scientific proof. It gained credibility and widespread recognition in the late 19th century to become a symptom-based model of treatment and cure. It is especially effective against infectious diseases, and is credited with achieving improvements in public health measures (Dunn, 1976; Chahal et al., 2014).
Traditional medicine	Traditional medicine is defined as a codified body of knowledge recorded in pharmacopoeias and ancient scriptures. Some branches predate modern medicine by a few millennia, while others originated around the 18th and 19th centuries. Under this system of medicine, illnesses are natural manifestations of imbalances in the human body and can be cured by restoring equilibrium through diet, herbs, therapies, other such measures. Traditional medicine has a broad scientific basis, and requires practitioners to undergo specialized training in order to practice (Dunn, 1976; Chahal et al., 2014).

Chapter 2: Review of Literature

2.1 Introduction

This chapter provides the conceptual background of the study. It begins with an explanation of medical pluralism in India and a brief description of the different types of medical practitioners. Subsequently, it discusses the role of modernization in India with a focus on its effects on migration and the availability of modern healthcare. The chapter also discusses the caste system of India to contextualize the population composition of the country. The epidemiological transition theory; healthcare usage patterns; factors that affect the availability of medicinal plants in IHR; and the effects of these on people of the IHR are discussed in subsequent sections in the chapter.

2.2 Medical Pluralism in India

Medical pluralism refers to the simultaneous existence and practice of two or more institutionalized branches of medicine in a society. In developing countries, this refers to the practice of Western medicine that governments promote, and non-Western, traditional forms of medicine that people are familiar with and have easy access to (Subedi, 1989; Chahal et al., 2014). The different forms of healthcare may be used alone, together, or in sequential order, sometimes for the same illness, depending on people's beliefs, ethnic identities, experiences, prevalent socio-cultural norms, accessibility to different types of healthcare, and advice received from their social network (Subedi, 1989). Generally, the older a society, the more varied and numerous their medical traditions. Moreover, different groups of populations within the same society/country may have different beliefs about concepts of health, illness, and medicine. Consequently, they may use different methods to treat the same illness. A medically pluralistic society is able to effectively cater to different belief systems and provide customized services to people.

India is an old, as well as large, country with an extremely diverse population inhabiting a wide range of geographical locations. Consequently, there is great demand for and practice of varied medical systems, each adapted to the requirements of the local populace. Medical pluralism has been practiced in India for millennia; several branches such as Ayurveda, Unani, Siddha, homoeopathy, traditional Chinese medicine, Traditional Tibetan Medicine (TTM) (Sowa—Rigpa), naturopathy, and yoga, in addition to folk healing methods such as shamanism, astrology, palmistry, tantrism, chanting ceremonies, and various other magico-religious

therapeutics can be found in abundance, and in different forms, around the country (Mrinal, Mrinal, & Mukerji, 1995; Kakar, 2013). Allopathic medicine, often referred to as "modern" or "English" medicine developed in industrialized countries, is part of India's colonial heritage and was introduced by the British in the late-eighteenth century (Banerji, 1981).

It is estimated that India's current population of 1.3 billion will grow to 1.7 billion by 2050 and that its 60+ population will grow from 8.9% in 2015 to 19.4% in 2050, resulting in almost 330 million older citizens by mid-century (United Nations, 2015). Moreover, 45.4% of India's disease burden is expected to be borne by older adults by 2030 (Chatterji et al., 2008). It is also estimated that 70% of India's population relies on some form of H/T/F medicine for basic healthcare needs (Vaidya & Devasagayam, 2007; Benzie & Wachtel-Galor, 2011). The majority of these users are older adults who make up a significant proportion of India's 833 million or 68.84% of rural population (Census of India, 2011a). In 2011, over 67 million older adults (60+) lived in rural India (Census of India, 2011a). Many reside in remote villages located very far from modern healthcare facilities. In such circumstances, the tried-and-tested, centuries-old healthcare systems are the only sources of available healthcare for millions of older adults.

India is a leading producer of medical personnel, a popular destination for medical research and tourism, and one of the largest manufacturers of generic drugs in the world (Gokhale & Kannan, 2017; Majumdar & Kishore, 2018). However, very little of these modern medical resources is available to its rural and poor populations. As a result, reliance on local medicine often becomes a necessity, especially for those such as older adults who may not have the means or the good health to be able to travel to bigger cities for modern healthcare.

The use of locally available medicine may also be a matter of choice and dominant cultural beliefs as health-seeking behavior in a medically pluralistic society is deeply influenced by socio-cultural norms. Murdock (1980) and Murdock, Wilson, & Frederick (1980) state two primary types of theories of illness: theories of natural causation (infection, stress/strain, organ deterioration, accident, overt human aggression) and those of supernatural causation (mystic, animistic, and magical such as fate, ominous sensations, contagion, mystical retribution, soul loss, spirit aggression, sorcery, and witchcraft). Depending on which of these people believe in, they may choose "the medicine man" over the "the man of medicine" or vice-versa. Currently, seventy per cent of India's population relies on the former rather than the latter for their healthcare needs (Vaidya & Devasagayam, 2007; Benzie & Wachtel-Galor, 2011).

Medical pluralism in the state of Uttarakhand.

The Government of India is making large-scale efforts to promote and re-popularize traditional medicine alongside modern medicine in India. Some of these medical traditions originated in other countries and spread to India, such as Unani that was introduced by the Arabs and Persians, or homoeopathy that was developed in Germany; other traditions originated in India and spread to neighboring countries, such as Sowa-Rigpa or TTM which had roots in India and spread across Tibet (Gurmet, 2004; Ministry of AYUSH, Government of India, 2017). Each of these medical systems enjoys varying levels of popularity and demand around the country based on people's belief systems. With an almost 83% Hindu population (Census, 2011a), Uttarakhand is especially renowned for Ayurveda and yoga. In the three villages that were selected for the study, Ayurveda was one of the two traditional branches of medicine that was available to the people. Uttarakhand also has a small Buddhist population (0.15%) (Census, 2011a), and shares its western border with Himachal Pradesh, the seat of Tibetan Buddhism in India. Therefore, TTM is also popular in the state, as it is across the north and north-east of India, and among Tibetan settlements in other parts of the country. This study will focus on these two traditional medical systems.

Practitioners of herbal, traditional, and folk medicines in Uttarakhand.

Herbal, traditional, folk, and modern medical systems each serve their client population in different capacities. Although the goal of all four systems is to cure illnesses, the practitioners of each system, and the methods that they adopt, vary greatly.

In this study, herbal medicine refers to self-use of medicinal herbs and spices to treat and cure illnesses. The practitioners of herbal medicine, therefore, are individuals and their family members. The knowledge and skills that they possess about health, illnesses, and cures are transferred from older to younger generations through oral and experiential means. Sometimes, people may depend on their social networks to share herbs or herbal medical knowledge. There is no intervention from recognized/formally trained herbal medical practitioners.

Traditional medicine is dependent upon the expertise of trained practitioners – *vaidya* for Ayurveda and *amchi* for TTM. In ancient times, students aspiring to become *vaidyas* lived in their teacher's or *Guru's* family residence as a member of the family and spent many years as student and apprentice – studying ancient texts; learning about medicinal herbs; gaining knowledge through instruction, direct observation, and inference; and practicing under the

watchful eye of the teacher. *Vaidyas* were respected members of the community who were required to live by strict social codes. They were highly regarded for their knowledge and service to the community (Basham, 1976). In modern times, a trainee *vaidya* is typically required to undergo 5.5 years of training to earn a Bachelor of Ayurvedic Medicine and Surgery degree, after which he/she may practice either independently or in an institutional setting such as an Ayurvedic clinic or hospital (Patwardhan, Gehlot, Singh, & Rathore, 2011).

In Tibetan medicine, *amchis* were traditionally trained through the lineage system - from father to son. Upon completion of several years of training, the new *amchi* was required to take an examination in the presence of expert *amchis* as well as the entire community before being accepted into the community as a medical practitioner. *Amchis* were considered to be representatives of the Medicine Buddha, and therefore, highly respected socially and spiritually. They were some of the most learned members of the community and were treated with great respect for their medical services and resourcefulness. In modern times, students must complete a six-year course to earn a Bachelor of Tibetan Medical System degree in order to practice Tibetan medicine (Gurmet, 2004). Similar to *vaidyas*, *amchis* have the option to serve their community by practicing independently or by becoming part of a larger medical facility.

Folk medicine is the third form of healthcare available to the residents of the IHR. In this study, folk medicine refers specifically to treatments undertaken through magico-religious means. In reality, however, folk medicine is inclusive of herbal medicine, and many informally trained practitioners, also called *vaidya* as a catch-all term for the medicine man, serve rural communities around the country (Matsuoka, 2015). Folk medicine may be practiced in various ways. For example, one study conducted in south India to explore temple healing among individuals with mental health diagnoses found that an average stay of six weeks in a non-threatening, supportive setting of a Hindu temple resulted in a reduction of nearly 20% in psychiatric rating scales among patients (Raguram, Venkateswaran, Ramakrishna, & Weiss, 2002). An exploration of healing rituals in the Himalayas found that when people experienced an illness that they could not treat, they visited oracles who, upon being possessed by local deities, answered their clients' questions in a trance. Based on the recommendation of the oracles, people visited exorcists to drive out aggravating spirits (Sax, 2014). Folk medicine is very diverse; it is specific to geographical location, ecosystems, and ethnic communities. Folk services may be provided by informally trained medicine men, by religious figures such as priests, or by ritual

healers who are possessed by spirits from time to time, and therefore, believed to be closer to divine powers.

In the case of both traditional and folk medicine, practitioners enjoy high rates of acceptance and elevated status not just because they have the medical knowledge and the means to reduce suffering, but also because they provide a sense of solace, familiarity, and reassurance to people. As community healthcare providers, they build personal relationships with people, and are socially accountable to them. Moreover, people feel closer to practitioners of these forms of medicine because they deal with all aspects of a person's life and not just the symptoms of illness. It is the lack of medicalization of human suffering that attracts people to the use of traditional and folk medicine (Sax, 2014).

2.3 Modernization in India

The twentieth century saw unprecedented scientific, technological, political, economic, and social progress in Western nations, and when India gained independence in 1947, it inherited the Western model of modernization from the British. Modernization invariably included urbanization, industrialization, and the resultant migration of labor. Consequently, traditional norms, family structures, and social support systems underwent fundamental change. As India has continued to develop in the last 70 years, additional forces of globalization, market liberalization, and technological advancements have placed enormous pressure to adjust and adapt traditional ways of life (Kashyap, 2004). The changes most relevant to this study include that of rural to urban migration, expansion of modern healthcare, and the caste system.

Migration.

Migration entails the movement of people from one place to another, usually for economic opportunities. Migration may be collective, such as a nuclear family breaking away from an extended family; it may also be individual, such as one member of the family moving away and leaving dependents behind in their original place of residence (Antman, 2012). India was traditionally an agrarian economy where entire families contributed to farm work and shared in the income generated from the activity. All family members played a significant role in the food production process, and multigenerational families were the norm. With migration, however, the family is no longer the unit of production. Migration separates not only members of a family, but also their resources, labor, and production output. Consequently, traditional ways of life undergo change, social kinship ties loosen, and households headed by females, especially

widowed women, rise. Additionally, traditional knowledge and skills are rendered useless, and families lose their educational and religious roles (Kashyap, 2004).

Modern healthcare.

Modern medicine became part of mainstream branches of medicine in India when the British introduced it around 1757 and promoted it as superior to traditional forms of medicine (Saini, 2016). The modern healthcare system is believed to be "highly selective, institutionalized, centralized and top down" by design rather than oversight; it "treats people as objects rather than subjects", and "has failed to address the needs of the majority, that is to say, the rural poor and indigenous people" (Patil, Somasundaram, & Goyal, 2002, p. 131). In recent years, India has increasingly decentralized its healthcare system to reach out to the rural poor by establishing the National Rural Health Mission (NRHM) that focuses on strengthening primary healthcare centers, recruiting and training grassroots-level community healthcare workers, establishing referral systems, and promoting public health (Ministry of Health and Family Welfare, Government of India, 2005). However, many villages continue to lack trained doctors due to poor government remuneration and doctors' unwillingness to serve in rural communities with little infrastructure, few opportunities for career growth, and negligible opportunities for entertainment and their own children's education and development (Jain, Gupta, Gupta,& Roy, 2016; Garg, Anand, & Singh, 2016). In such cases, other healthcare workers such as pharmacists and nurses perform the roles of doctors. In case these healthcare personnel are also unavailable, traditional and folk medical practitioners come to the rescue (Patil, Somasundaram, & Goyal, 2002).

Caste system.

The caste system has been integral to the social stratification of Hindu Indian society for many centuries. It is rooted in religion, based on division of labor, and dictates the type of occupation an individual may pursue and the social interactions one may engage in. Castes are ranked in hierarchical order and strictly determine the behavior of those born into them. The caste structure was considered to be a means of creating and organizing an effective society where every caste performed a unique function to serve the rest of society.

The caste system in India is believed to be almost 3,000 years old. The population of ancient Hindu society was divided into four mutually exclusive, exhaustive, hereditary, endogamous and occupation-specific *varnas* or castes, and all social customs of Hindus were

modelled and interrelated to fit this system (Deshpande, 2000, p. 322). In descending order the castes are: *Brahmana/Brahmin* – comprising those who are engaged in scriptural education and teaching. Priests and teachers belong to this class; *Kshatriya* – also called the 'warrior caste'. Individuals belonging to this class are engaged in public service, administration, maintenance of law and order, and defense. Most rulers/kings belonged to this caste; *Vaishya* –the caste of tradesmen and merchants. This caste engages in commercial activities such as moneylending and business; and *Shudra* – the fourth caste, also commonly referred to as the 'lower caste'. Individuals belonging to this caste perform menial jobs and work as semi-skilled or unskilled laborers and servants. The first three castes are considered superior to the fourth caste, and are often referred to as the 'twice born' where the 'first birth' is physical and the 'second birth' is spiritual. The 'second birth' is considered to occur when an individual takes up a meaningful, pre-determined role in society.

Although the traditional caste system specified only four *varnas*, another social class was created over time for those who were considered to be the lowest of all castes and subordinate to everyone. This caste came to be known as *Ati Shudra* or the untouchables/outcasts. Mahatma Gandhi called them *Harijans* or the 'children of God'. They are also commonly called *Dalits*. People belonging to this caste do the 'dirty work' of society such as manual scavenging, clearing ashes after cremation, sweeping streets, collecting/segregating garbage, cleaning sewers, leather work, removing animal carcasses, and so on. People belonging to this caste have been historically oppressed, culturally subjugated, and politically marginalized for a very long time. The principles of untouchability and 'purity and pollution' go to great lengths to dictate what *Ati Shudras* or *Dalits* can or cannot do; which places they may enter; what water sources they may use; who they may eat, marry or socialize with; what roads they may use; what occupations they may engage in; where they may build their houses (often low-lying flood-prone areas of villages); how far apart their children should sit from other children in school classrooms to avoid 'contamination'; and other such rules (Vaid, 2014; Majid and Zahid, 2014).

Scheduled castes and schedules tribes.

The Indian population is currently divided into four broad categories: Scheduled Castes (SC), Scheduled Tribes (ST), Other Backward Classes (OBC) and Forward Caste (usually called 'General Category' or 'General Class'). SC and ST are official designations given by the constitution of India to various diverse groups who are considered to be historically

disadvantaged. During British rule, these groups were called 'depressed classes' as they were economically, educationally and socially marginalized. In an effort to level the playing field for all groups in the country, the Government of India, post-independence in 1947, gave SCs and STs Reservation status. This status affords them special quotas on various platforms so as to pull them up from a position of underrepresentation to one of equality with the General Category. The OBC category came into existence in the 1990s after much contentious debate because OBC status includes not only caste but also class and any community (except SC/ST) that is socially, economically and educationally backward or disadvantaged (Vaid, 2014). Till date, it is unclear exactly how many OBCs are there in the country. By definition, "OBCs comprise, by and large, the lower rungs of the *Shudras* who, in the past, suffered from varying degrees of ritual prohibitions applied to the *a-dvijas* (literally, those not "twice-born") and remain till today socially and occupationally disadvantaged" (Sheth, 2004, p. 44). Generally, OBCs belong to the fourth *varna* of the traditional caste system. The fifth caste, the *Ati-Shudras*, make up the SC category. Tribal groups (similar to ethnic groups) make up the ST category. Almost all others belong to the General Category. There are, however, variations in how these categorizations are used and understood by people, and although the principles of the Indian constitution forbid caste-based discrimination, the inherent inequality and stratification of Indian society continues to this day. Consideration of castes and tribes is important as the populations of the villages selected for the study are made up of castes, sub-castes, and the *Bhotiya* tribe.

The *Bhotiyas*[1] are one of the 705 notified STs in India. STs comprise 8.6% of the total population, and around 90% of them live in rural areas (Census, 2011a). The *Bhotiyas* are predominantly residents of the central Himalayas along the Indo-Tibetan and Indo-Nepal borders. The members of this tribe were associated with this name due to their Mongoloid features as well as their trading relations with Tibet, also called *Bod* or *Bhot Desh* – another name for Tibet. There are eight major *Bhotiya* groups scattered around the state of Uttarakhand around eight main valleys; each group is further divided into clans and lineages to indicate ancestry and form marriage alliances. The group inhabiting the villages included in this study are called the *Jadhs* of the Bhagirathi River valley. They are a Buddhist, semi-pastoral, transhumant tribal community (Maikhuri, Nautiyal, Rao, & Semwal, 2000; Samal, Dhyani & Dollo, 2010).

[1] The term *Bhotiya* is commonly used in India. However, in surrounding countries such as Nepal, it is viewed as a derogatory term.

2.4 Epidemiological Transition

This subsection describes the epidemiological transition model and considers its potential relevance to the villages in the study. It also looks at people's healthcare decision making or "pattern of resort" in a medically pluralistic society. Epidemiological transition describes shifts in patterns of fertility, mortality, life expectancy, causes of death, population size, and age distribution of a population. According to Omran (2005), who introduced the concept in 1979, a society undergoes three major stages of long-term transition that alters its disease profile and changes its population composition. The first stage - The Age of Pestilence and Famine – is characterized by high rates of mortality from epidemics, war, and famine, and low average life expectancy at birth, both of which arrest population growth. The second stage – The Age of Receding Pandemics – witnesses a significant drop in mortality from previously-known causes such as epidemics; life expectancy at birth registers a steady rise; and there is noticeable, rapid population growth. The third stage – The Age of Degenerative and Man-Made Diseases – is characterized by a steady decline in mortality rates that stabilize at relatively low levels; life expectancy is higher than ever before; and population growth depends greatly on fertility rates. In the process of this transition, the disease profile of a population changes from infectious diseases caused by lack of hygiene, nutrition, immunization, sanitation, and other public health measures to degenerative diseases associated with changes in lifestyle and increased life expectancy.

The epidemiological transition model progresses in a linear fashion suggesting that most societies experience the transition in the same sequence and that the demographic changes, socio-economic developments, healthcare advancements, and forces of modernization that accompany and aid the epidemiological transition process are expected to affect all societies in a similar manner. While this has been true of most Western nations where each of these factors evolved simultaneously and disease profiles saw marked differences in the different stages, developing countries have not fared as well. Currently, most developing societies are facing a triple burden of disease – a combination of causes of mortality from all three stages of the model. These include: infectious diseases, undernutrition, and maternal mortality; lifestyle diseases such as diabetes, cancer, heart disease, and mental illnesses; and pandemics related to globalization and climate change (Frenk & Gomez-Dantes, 2011). The co-existence of different types of health

concerns is reflected in the types of medicines and healthcare services that a population requires, and medical pluralism may to be an effective way to serve that need.

Pattern of resort.

Pattern of resort or hierarchy of resort (Schwartz, 1969) refers to the order in which people make use of competing healthcare resources. This pattern is generally determined by beliefs and perceptions, which in turn are informed by one's social environment. In many developing countries, people prefer to first use home remedies. If these are not effective, they consult with their network to make decisions regarding other available options – folk, traditional or modern healthcare (Subedi, 1989). The first resort is always a matter of preference and loyalty to tradition and familiarity; the last resort is the result of the exhaustion of all previous options. Each alternative has a different meaning for the users of healthcare; each serves a different socio-moral function (Schwartz, 1969). The preference for traditional or folk systems of medicine lies in the socio-cultural closeness that people experience with them. Moreover, these systems are viewed as more holistic as they not only address the illness, but also the experience of illness, thereby focusing on the person and the socio-cultural context rather than just the symptoms of illness (Subedi, 1989). Pattern of resort may also be determined by perceived causation of illnesses. If health concerns are believed to be caused by supernatural causes, people may resort to folk or traditional cures. If an illness can be attributed to organic damage, modern medicine may be chosen (Beals, 1976; Schwartz, 1969). Sometimes, the high cost of modern healthcare (dependent on the doctor's diagnosis rather than the individual's diagnosis), long queues at hospitals and clinics (resulting in loss of work hours), lack of certainty of a cure, and the prospect of being diagnosed with unfamiliar illnesses for which one must buy unfamiliar and expensive medicines, may also propel people towards the use of folk and traditional medicine over modern medicine (Beals, 1976). Generally, the pattern or hierarchy of resort in medically pluralistic developing countries begins with home herbal remedies and ends with modern healthcare. This study provides insight into the healthcare choices made by the village residents in the presence of all four types of healthcare options.

2.5 Medicinal Plants in the IHR

Residents of the IHR rely greatly on herbal medicine, and herbal medicine is dependent on the availability of a wide variety of medicinal flora. However, the diversity and abundance of medicinal plant species that form the foundation of the healthcare system in rural IHR, is under

considerable threat. Although medicinal plants are available all over the country, the IHR is one of the richest repositories of medicinal flora in the world with almost 45% of its 18,440 known plant species having medicinal properties that form the foundation of its deeply-rooted codified, folk, and allied medical traditions (Gupta, Sharma, & Sharma, 2014). Consequently, herbal medicine has been used to address the healthcare needs of the local people for a very long time.

Older adults inhabiting the IHR are some of the most knowledgeable resources for herbal medicine. They are also the primary users of this form of healthcare. As recognized herbal medicine practitioners, they are valued members of society. Additionally, they are entrusted with the responsibility of transferring inherited medical knowledge to future generations and upholding traditions and customs that celebrate and worship medicinal flora as a source of good health and well-being. Older adults' nutrition and food security, livelihoods, socio-cultural norms, and health status are inextricably tied to the use of medicinal plants. Consequently, any changes in the availability of medicinal plant species in the IHR impact the health and healthcare options of the older generations the most. Unfortunately, many such species are under significant threat due to climate change, over-extraction, habitat destruction, and natural disasters (Badola & Aitken, 2003; Kala, 2000).

Factors affecting the availability of medicinal plants.

Climate change.

Climate change, as it is currently understood, is largely a man-made phenomenon that involves increasing the earth's temperature at a very rapid pace through the excessive burning of fossil fuels (IPCC, 2007; UNFCCC, 2011). The fallouts of this process include rising air and ocean temperatures; increased risk of floods, droughts, and wildfires; stronger and frequent tropical storms and hurricanes; rapidly melting glaciers; fluctuations in precipitation; and rising sea levels, among others (Environmental Defense Fund, 2018; The Nature Conservancy, 2018). Climate change affects everybody, although the effects are not distributed uniformly across regions and populations. Some regions are more vulnerable than others - the Himalayan region is one such vulnerable area. Similarly, some populations are more vulnerable than others, and older adults around the world form a significant proportion of that population.

The impact of climate change on the Himalayan region has been the topic of considerable research and concern for decades. Often called the "third pole" for its vast reserves of fresh water, it experiences a significantly higher rate of warming than the global average, with rates

higher at higher altitudes (International Centre for Integrated Mountain Development [ICIMOD] Foundation, n.d.). Medicinal plants, a high value product, are a major casualty of this phenomenon.

Climate change has hindered the cultivation of crops and the natural regeneration of medicinal plants in the Himalayas in various ways. In the last decade, the mountain regions of India, Nepal, and Bangladesh have experienced an increase in extreme rainfall events. At the same time, parts of Pakistan and Northeast India have seen a decline in annual rainfall (Levacher, 2014). For a region with high, and sometimes sole, dependence on monsoons and snow melt for irrigation of farms and pastures, the cultivation of crops, including medicinal plants, is becoming a concern. In Ladakh, a high altitude desert in India, for example, village after village is giving up farming as reduced snowfall and snow melt has deprived communities of their only source of irrigation water (Navdanya, n.d). Although warmer temperatures have reduced snowfall, they have significantly increased the rate of glacier melt which has led to several flooding incidents in the recent past. Conversely, the region also continues to experience extreme and lengthy drought conditions. The uncertainly of water availability is proving to be a deterrent for cultivation; it is also adversely impacting the growth and regeneration of medicinal plants in the wild. Additionally, it is raising fears about creating large numbers of climate migrants – those who are forced to give up their homes and traditional occupations due to sudden, irreversible changes in their local environment (Levacher, 2014; Navdanya, n.d.).

An additional aspect of climate change is that of temperature-related impacts. Rising temperatures force the upward migration of plant species and move tree lines to higher altitudes, endangering the flora of the higher altitudes with limited space to grow and thrive (Grace, Berninger, & Nagy, 2002; Forrest et al., 2012). Plant species that require the cold temperatures of the mountains are gradually becoming extinct due to the lack of favorable climatic conditions. Destructive pest attacks have become more common, and higher temperatures, along with uncertain water availability, are changing the structure and nutrient content of the soil in the region (Sharma et al., 2009). Although an increase in carbon dioxide is said to facilitate the growth of some plant species, it remains a concern as it aides the growth of weeds and invasive species that are detrimental to native species (Grace et al., 2002).

A study (Harish, Dandin, Umesha, & Pallavi, 2012-13) examining climate change threats to medicinal plant species of India states that different species respond differently to climate

change – some species stay in place, some adapt, and some become extinct. Species that rely on each other and co-exist may together be driven to extinction if they can no longer co-occur in the same time or space. Pests, diseases, and invasive species may spread to newer territory and put pressure on an already fragile ecosystem. Species that have long gestational periods or specific habitat requirements are more prone to becoming extinct. Migration of specific species may lead to changes in species community composition and result in extinction. Higher temperatures are expected to continue to force cold, alpine species to migrate upward until there are no areas left to inhabit, at which point they will be faced with extinction. Rapidly changing climatic conditions favor species that can spread and adapt easily – unfortunately, these are traits shared by many invasive species. Finally, as medicinal plant species migrate from lower to higher altitudes, many of them lose the richness of their species (p. 4-5). Climate change, therefore, has the potential to impact the cultivation as well as the regeneration of medicinal plants in their natural habitats in many different ways.

Over-extraction.

Although climate change is considered to be one of the strongest forces affecting the availability and cultivation of medicinal plants in the Himalayas, over-extraction of medicinal plant species from forests is also a cause for considerable concern. The Himalayas are one of the 35 "biodiversity hotspots" around the world, and their indigenous, native, endemic medicinal plant species are in high demand in domestic and international markets.

According to the Food and Agriculture Organization (Kuipers, 1995), the bulk of medicinal plants around the world is harvested from the wild. Although almost 80% of the world population is dependent on traditional medicine, extraction of medicinal plants from the wild is usually not detrimental to plant survival as quantities harvested tend to be small. Extraction only becomes a problem when it is done for the purposes of commercial trade. As medicinal plant gatherers tend to make low wages, and those in remote rural areas often rely on gathering as their sole source of income, they are often motivated to "mine" the natural resources rather than manage them. The availability of cheap labor to undertake the very labor-intensive work of medicinal plant gathering is critical to the practice of over-harvesting or unsustainable harvesting from the wild (Kuipers, 1995).

Medicinal plants are usually traded in three sectors: at the first level is national trade often involving hundreds of species (Kuipers, 1995). This level of trading usually takes place in

regional markets. At present 1,286 herbal drug entities representing 960 species amounting to 137,000 metric tons of materials are traded within India, with 178 species exceeding 100 metric tons in consumption per year (National Medicinal Plants Board [NMPB], Government of India, 2009). At the second level, trade remains informal and crosses national boundaries but stays within the same continent. Although this level of trading is done with fewer species, the species are often threatened. The third level comprises export trade. At this level, only a few species are traded, but in significant volumes. India currently exports 48 species in large quantities (Kumar & Janagam, 2011). As health-seeking behaviors around the world continue to change and western markets recognize the benefits of herbal remedies, supplements, and complementary and alternative medicines, demand for medicinal plants will continue to rise. It is estimated by the World Health Organization (WHO) that the global herbal trade will be valued at $5 trillion by 2050 (Kumar & Janagam, 2011).

India, unlike many developing countries, enforces strict regulations and has banned the export of several wild medicinal species in their raw form. Export of finished products containing the ingredient, however, is allowed. Despite such laws being in place, a large proportion of medicinal plants collected in India are extracted from the wild using destructive techniques. Moreover, a significant proportion of high altitude Himalayan plants are wild harvested and many species are at the brink of extinction due to overharvesting or unskillful harvesting (Kuipers, 1995).

Habitat destruction.

The third related factor responsible for decreased availability of medicinal plants is that of habitat destruction. Habitat destruction is said to have taken place when enough changes have occurred in an ecosystem or microclimate that it is no longer able to support local flora and fauna. Habitat destruction of medicinal plants may occur directly or indirectly. It is not necessary to unsustainably overharvest medicinal plants to destroy their habitat; it can be done by removing other "support systems" in the region. For example, *Desert cistanche*, a medicinal herb native to China and Mongolia, is gradually becoming less abundantly available as the trees it parasitizes are harvested for timber and fuelwood (International Union for Conservation of Nature, 2008). The most common cause of habitat destruction, however, is unsustainable harvesting. As many or all parts of some plants are useful for their medicinal properties, unsustainable harvesting methods uproot entire plants in large quantities, leaving little behind to regenerate.

It is often suggested that large-scale scientific cultivation of medicinal plants can address issues of quality, sustainability, and habitat preservation. This, however, is unlikely in reality. The NMPB of India outlines a few reasons explaining why: the chemical complexity of botanicals upon which traditional medical systems rely can only be achieved through biotic and abiotic stresses that plants undergo in the competitive environments of the wild. Such conditions are difficult to replicate in farming conditions. For many species, optimal conditions for different stages of growth are not documented. This further prevents the replication of a favorable environment. The survival of many species is inextricably tied to the presence of other flora and fauna, and farming cannot provide the same ecosystem. In India, 6 million man-days of employment are tied to communities living in or near forests that collect medicinal herbs during non-agricultural seasons. Moving the medicinal plant sector to commercial farming would raise ethical issues. Additionally, the diversion of fertile agricultural land to non-food crops like medicinal plants can impact the country's food security, in addition to raising issues related to land use. Finally, a number of species are used in small quantities and this offers little incentive to take up medicinal plant farming (NMPB, 2009, p. 2). It is generally agreed that the best way to procure high quality medicinal plants is to let them grow naturally in the wild. This would mean protecting their habitats to focus on natural regeneration, upgrading the harvesting skills of gatherers, and providing linkages and fair trade opportunities for those working in the sector (NMPB, 2009).

Natural and man-made disasters.

Disasters – natural or man-made, climate change-induced or not - are becoming increasingly frequent in the Himalayan region. According to ICIMOD, India's Himalayan region was hit by 532 natural disasters between 1990 and 2012, second only to the 670 disasters that hit Chinese side of the mountain range (Hindustan Times, 2013). Most of the disasters were trans-boundary in nature and affected life, property, livelihoods, agriculture, livestock, and regional biodiversity across nations.

More recently, there have been multiple instances of floods, flash floods, earthquakes, landslides, rock falls, and cloudbursts. Widespread fires have burned down thousands of hectares of dry forests; strong winds and floods regularly erode top soil; and the region is constantly watching for glacial lake outburst floods (GLOF) (ICIMOD, 2011), and the inevitable "great Himalayan earthquake" (FirstPost, 2015; Varshney, 2015) that experts warn can happen any day

and that is expected to be of a much higher intensity than the one that ravaged Nepal in 2015 or Kashmir in 2005 when it killed over 100,000 people and rendered hundreds of thousands of people homeless in Pakistan and India. All of these threaten the biodiversity of the Himalayan region and raise concerns about the future availability of medicinal plants upon which a significant proportion of the local population relies for nutrition and healthcare.

Impact on people.

A number of academic-research institutions, NGOs, and grassroots organizations, funded by national, international, intergovernmental, and corporate grants, have studied the coping mechanisms and adaptation techniques of people in the IHR who are faced with environmental uncertainties and threats to their food, health, water, energy, and livelihood security; family structures; and cultural traditions. This section will review a few such reports – some focus on adaptation measures related specifically to medicinal plants, others talk about adaptation to climate uncertainties in general. As it is hard to isolate the impact on medicinal plants from the larger context of environmental impacts on people's lives, some non-medicinal plant-related experiences have been included. Moreover, as little research has been undertaken in this field with older adults specifically, most of the reports reflect the "voices of communities" rather than those of specific age groups.

A study funded by the Swiss Agency for Development and Cooperation in 2016 in the Himalayan state of Himachal Pradesh, India, found that people believed that climate change was changing their lifestyles and livelihoods significantly (Indian Himalayas Climate Adaptation Program [IHCAP], 2016). The survey, conducted in Kullu district in 31 villages covering 370 households, was completed by 791 community participants in the age group of 16 – 60 years. The study was aimed at gaining insight into community perceptions of climate vulnerability and adaptation responses.

The study found that a large proportion of the villages' population had migrated to cities for employment opportunities. Of those who remained, most had given up agriculture in favor of horticulture for better income prospects, and some had taken up jobs in hotels, transportation, and adventure tourism. The number of livestock in the villages had decreased over the years, and the cultivation of horticultural crops and some cash crops had significantly reduced the production of traditional food crops. Most villagers felt that both agricultural and horticultural activities has been affected by irregular rainfall, higher temperatures, pest attacks, outbreak of

diseases, reduced snowfall, forest degradation, and a decline in cattle population. Vegetable and spice yields had also been significantly impacted by these factors. As insects and pests were beginning to thrive in higher (and now, warmer) altitudes, the communities had to increase their use of chemical fertilizers, insecticides, and pesticides which in turn led to low fertility of crops and soil degradation. Most households also had to reevaluate their reliance on traditional water sources for irrigation and household consumption. Additionally, people in the villages were trying to adjust to early onset of summer and monsoon seasons, shorter and warmer winters, and "totally unpredictable" rainfall (IHCAP, 2016).

A project funded by the United Nations Development Programme (UNDP) in the state of Uttarakhand found that residents of village Jhuni, who have a rich tradition of indigenous healing practices and a number of Globally Significant Medicinal Plants (GSMP) in the surrounding forests, were concerned about environmental threats to the medicinal plant population in their forests (UNDP, 2012a). The community has light and aggressive treatments for migraines, foot sprains, chronic stomach aches, herpes, fever, cold, viral infections, and for illnesses of animals. They have a number of faith healers who have learned *mantras* (chants) passed down through generations that can treat snake bites, dyspepsia, dysentery, stomach aches, cataract, bad vibes, and herpes. For jaundice, however, they summon a faith healer from a neighboring village.

The residents of this village have always lived harmoniously with their natural surroundings – they partake of its bounty and in return protect, conserve, and worship the forests. In recent times, however, they are struggling with a grim reality. According to one participant included in the study by UNDP:

> … the situation will be beyond repair and our way of life will be lost forever if the threats are not addressed immediately…the remaining tracts of *Kharsu* Oak (*Querqus semecarpifolia*) unique to the Himalayas are struggling for survival and it may not be long before we lose these rich forests to climate change, overexploitation and sheer neglect. Our primary threat is the increasing pressure on our limited resources and unsustainable harvesting of the forest produce in our community forest due to lack of awareness…If our rights to access are curbed and the newer generations of our community is getting alienated from the forest, a large chunk of our traditional knowledge base which has been developed over centuries by successive generations, will wither and die out. (p. 13)

The community, in partnership with local NGOs and as part of the UNDP-funded project, is creating a Bio-cultural Community Protocol that will protect its forests, facilitate sustainable harvesting of medicinal plants, and promote cultivation of the most threatened medicinal species that are in high demand (UNDP, 2012a).

Sentiments similar to those in Uttarakhand were also shared by a community of 30 families in the remote mountains Arunachal Pradesh in north-east India (UNDP, 2012b). The residents of village Salari have been dependent on H/F medicine for hundreds of years. Most often, H/F medicine is their first and only line of treatment. Local healthcare knowledge is used to treat common and chronic ailments that include coughs and colds, skin diseases, jaundice, asthma, broken bones, wounds, joint pains, snake bites, insect stings, stomach ache, malaria, diarrhoea and gastritis. The Salaris being deeply spiritual, a large number of their medicinal plants are used in rituals and religious healing. Medicinal plants are also often blessed by monks before use. Women have specific traditional knowledge related to childbirth and pre-and post-natal care, and cleansing of the body is usually accompanied by cleansing of the spirit. The residents of Salari village, however, are fearful of the changes that they are witnessing. According to a participant included in the study by UNDP - "Today, we are feeling increasingly threatened with the dramatic changes that we see all around us. Development has brought with it values that are so different from the traditional ones that we hold" (p. 5). The small village of Salari is now actively educating and empowering its residents with knowledge of international, national, and state-level biodiversity conservation treaties/legislations to protect its traditional knowledge and ways of life.

It is important to note that the impacts of environmental degradation are not limited to flora and fauna alone. Major repercussions of this phenomenon include the changing nature of diseases being experienced by the residents of the IHR. Foremost among these is the increased burden of infectious diseases. According to Sarkar (2010), "…there is ample reason to expect that climate change in the Himalayas will lead to a significant increase in the regional infectious disease burden due, in particular, to vector-borne tropical diseases that have historically been absent from the Himalayas"(p. 7).

The author provides three reasons for this: the first threat relates to deteriorating water quality. Himalayan glaciers are currently melting at alarming rates, leading to an excess of water supply downstream. Soon, however, the region will face acute water shortage owing to

negligible glacier melt. The shortage of clean, good quality water and the contamination of drinking water due to floods will also increase the risk of diarrheal disease. The WHO cites the case of the small Himalayan kingdom of Bhutan, where 10-15% of morbidity cases are a result of diarrheal diseases. This number can only increase unless preventive measures are taken at the earliest for 24 out of Bhutan's 2,674 glacial lakes are considered dangerous and pose an imminent risk of GLOFs (WHO, 2018). Cholera may also emerge as a significant threat due to its known association with climate conditions, and given its current incidence in some parts of Nepal and the IHR (Sarkar, 2010).

The second threat is linked to air quality. An increase in pollutants such as nitrogen dioxide and airborne particles, particularly in urban towns, will affect the air quality and lead to increased risk of cardio-respiratory diseases in the IHR (Sarkar, 2010).

The third threat is an increased risk of vector-borne diseases. A steady rise in temperatures will allow tropical diseases to expand their range at higher elevations where they never occurred before. Most vector-borne diseases are reservoir-dependent and diseases like malaria, dengue, and *kala azar* (black fever) have already begun to surface in the region. It is also expected that Himalayan populations, with no prior history or experience with such diseases, will be more vulnerable than the country's tropical population. Experts in cross-disciplinary fields are now calling for increased quantitative epidemiological health research in the region (Sarkar, 2010).

Older adults in the Himalayas seem to be facing the prospect of triple jeopardy – medicinal plants are becoming difficult to procure, thereby affecting the herbal healthcare system; the quality of natural resources, such as water and air, are deteriorating; and people are now experiencing new diseases, especially infectious diseases, for which they may not have easy access to modern medicine. Older adults are not only more severely affected by infectious diseases, but their rate of recovery from such diseases is quite low (Yoshikawa, 2000). Additionally, older adults experience infections differently than younger adults. The deterioration of immune functions affects older adults' resistance to infections. They may also present blunted or atypical symptoms, or sometimes even an absence of symptoms, which may result in delayed diagnosis and treatment. Infectious diseases in old age may also be caused by more diverse pathogens than in younger ages. This makes older adults more vulnerable to such diseases than younger adults. Moreover, age-related changes in the body can interfere with body

– drug interaction. Finally, as renal function and muscle mass decline is common in old age, the use of antibiotics and anti-microbial therapies become difficult and often risky in older adults (Yoshikawa, 2000).

Given the multiple threats to the lives and health of older adults in the IHR, it becomes imperative to understand how people understand, share, and address their concerns when multiple aspects of their lives are impacted simultaneously by environmental and social changes. This study will attempt to explore this experience and fill a gap in existing literature.

Chapter 3: Research Methodology

3.1 Introduction

This chapter discusses the methods used to address the research questions of the study. This study was undertaken using a qualitative research approach with ethnographic data collection techniques. This chapter describes (a) rationale for research approach, (b) research location, (c) sample selection and rationale, (d) participant recruitment strategy, (e) data collection methods, (f) field notes and memos, (h) data analysis strategy, (h) trustworthiness of data, and (i) positioning of the researcher.

3.2 Rationale for Research Approach

Qualitative research involves an interpretative and naturalistic approach toward its subject matter. It necessitates that researchers study people and things in their natural settings to understand and interpret various phenomena and the meanings that people attach to them (Denzin & Lincoln, 2011). It uses an inductive-deductive approach to develop deep understanding of the human perspective vis-à-vis people's everyday life experiences (Creswell, 2013). It relies on a number of empirical materials – interviews, observations, meaningful objects, audio-visual representations, life stories, personal experiences, and introspection – to explore the lives of people beyond that which is readily known and visible to the naked eye (Creswell, 2013; Richards & Morse, 2013). As Creswell (2013) aptly states, qualitative research "…is an intricate fabric composed of minute threads, many colors, different textures, and various blends of material. This fabric is not explained easily or simply" (p. 42). As such, qualitative research involves complex reasoning, using the researcher as a key instrument of data collection, to provide in-depth, holistic understanding of issues being explored (Creswell, 2013).

Ethnography as a qualitative research method focuses on a culture-sharing group that involves many people who interact over a period of time (Creswell, 2013) Although the method has evolved over time and is no longer restricted to the academic pursuit of a "lone scholar" living with and learning about exotic tribes and communities, it retains the basic requirements for cultural immersion and intensive "fieldwork". It provides a holistic approach to learning about sociocultural contexts, processes, and meanings from both emic and etic perspectives; it is an iterative, open-ended, emergent, interpretive, and constructive learning process; and it presents the world of the host population "thickly" with the help of details, contexts, and meanings rather

than just facts without interpretation. In this way, ethnography becomes both the process and the outcome of research (Geertz, 1973; Whitehead, 2005; Creswell, 2013; Richards & Morse, 2013).

This study benefitted greatly from the qualitative-ethnographic approach as it aimed to explore and understand from a unique population their lived experiences, lifestyles, traditions, customs, health concerns, healthcare behaviors, and the future of their traditional knowledge. The study necessitated observation of and immersion in community life, informal interactions with village residents, interviews with key informants, and extensive recording of memos and field notes to learn about a wide range of social, environmental, and health concerns experienced by the participants and their families.

3.3 Research Location (see Appendix A for map depicting research location)

The study was carried out in three villages that lie on the banks of the Bhagirathi River in Uttarkashi district in the state of Uttarakhand in northern India. The IHR is divided into four broad zones according to altitude. In ascending order these are*:* the foothills *(*Bhabar, Terai, Shivaliks), the Lesser or Lower Himalayas, the Greater Himalayas, and the Trans-Himalayas (cold deserts). Uttarkashi district shares part of its northern border with Tibet (China) and is located in the Greater Himalayan region. Per Census of India (2011b), Uttarkashi is the least urbanized district in the state with only 7.36% of its 330,086-strong population living in urban areas in three towns. The remaining population resides in its 694 inhabited villages. It has the lowest population density in the state (41 per sq.km.) and only 67,602 households. The literacy rate is around 76% and the population includes Scheduled Castes, Scheduled Tribes, and local mountain people. As part of the state of Uttarakhand that is also called *devbhoomi* or "land of the gods", the people of Uttarkashi hold their land sacred. Uttarkashi enjoys varied geographic and climatic conditions that facilitate the growth of numerous species of endemic and native medicinal flora in its 60-80% forest-covered land. Consequently, herbal medicine is widely practiced and favored in the region.

3.4 Sample Selection and Rationale

This study was undertaken with individuals who identified as older adults. Although the age of 60 years is used as the demarcation by the Government of India for the provision of subsidies and services for the older population, this study includes participants who were age 55 and above if they identified as being an older adult. The reasons for participants' self-identification varied: some used their chronological age to identify as old; some used life-based

events such as the death of spouse or peers; some based their self-identification on the fulfilment of social and filial roles such as marriage of children or attainment of grandparenthood; some put stock by physical features such as graying hair; and some based their identification on health concerns such as hearing impairment or slowing down of the body, to determine if they met the age criteria for the study. The lowering of the age range also allowed the researcher to expand the pool of potential participants for key informant interviews. In most cases, the participants' self-identification as old also matched the perceptions of the community in who they viewed as "old". The researcher took this into consideration when identifying key informants for interviews. Contrary to the expectation that some participants may not be aware of their actual age, all participants were able to communicate their age to the researcher.

The second criterion for the inclusion of participants was the number of years they had resided in the villages. As the study sought to explore how changes in people's natural and social environment over time had altered their perceptions, beliefs, and adaptation techniques related to health and H/T/F healthcare, long-term residents were expected to be better informed about such changes, and therefore, better suited to answer the research questions. The researcher did not face any difficulty with this aspect of participant recruitment as all older adults in the villages, including those who did not participate, had been residents of the villages for several decades.

Sampling method.

Participants for the study were selected using a purposive sampling method. Purposive sampling is widely used in qualitative research to identify and select information-rich cases that are closely related to the phenomenon being studied. Such cases are consciously selected as they are best able to answer the research question (Patton, 1990; Marshall, 1996; Palinkas et al., 2013). In this study, long-term older residents of the villages were deemed to be most knowledgeable about the topic of research, and therefore, best quipped to address the research questions. Additionally, it was expected that the participants would help to expand the pool of potential respondents by identifying friends, relatives or family members who they thought would be able to serve the purpose of the study. Finally, this study was aimed at collecting in-depth information about a particular population experiencing a particular phenomenon, and purposive sampling provided the resources to further the objectives of the study.

Sample size.

The final sample size comprised 32 key informant interviews – 25 interviews with village residents (hereafter referred to as "primary participants") and 7 interviews with traditional, folk, and modern medicine practitioners (hereafter referred to as "allied participants"). The sample size of 25 primary participants was determined by data saturation; the sample size of 7 allied participants was determined by the recommendation of the primary participants. Data saturation is the stage at which information becomes repetitive and no new information is likely to be uncovered. In such a scenario, the complexity, range, and distribution of experiences or views of interest become very limited and add nothing more to enrich the data already collected (Guest, Bunce, & Johnson, 2006; Francis et al., 2010). One study suggests between 12 and 60 participants, with 30 being the mean, as the ideal sample size for qualitative studies (Baker & Edwards, 2012); another recommends between 5 and 25 participants (Guest et al., 2006); yet another study suggests that the optimal sample size depends on the composition of the group – the more heterogeneous the population, the larger should be the sample size as data saturation will take longer to achieve (Guest, Namey, & Mitchell, 2012). This study included representations from a diverse population in terms of age, gender, religion, educational background, and occupation, from residents of three villages. Data saturation with primary participants was achieved toward the end of 23 interviews. The researcher, however, conducted two additional interviews in order to be certain of data saturation before ending the process at 25 interviews with primary participants. This number pertains only to key informant interviews and not to the informal conversations undertaken with residents during the course of data collection.

3.5 Participant Recruitment Strategy

Efforts toward participant recruitment began approximately a month before the researcher arrived at the location to undertake data collection. As a first step, the researcher established contact with a colleague who had previously worked with her on projects related to biodiversity conservation in the state of Uttarakhand. The colleague, still engaged in similar work, but in another state, put her in contact with representatives of four organizations based in Uttarkashi town – one local NGO, one international NGO, one environmental organization, and one medicinal plant research institute – all of whom could provide her with insight into the local populace and help her to select villages for her study.

Upon her arrival in Uttarkashi town, the researcher met with all four contacts who further introduced her to colleagues who were working on various projects in specific villages. At the end of several meetings and discussions over the span of a week it was decided that the last four inhabited villages below the Indo-China border would be good choices for the study as they were within 1-3 kilometers of each other and would allow the researcher to accommodate changes in plans and be more flexible. Moreover, one of the villages offered several accommodation options as it was a transit point for most travelers in the region. It was during one of these meetings that the researcher was introduced to a professor in Uttarkashi town who had run livelihood projects in two of the four villages, and had contacts with people within the villages who could act as resource persons for the researcher. The professor informed the potential resource persons about this study and requested them to help with participant recruitment and translation of the consent script, interview guide, and interviews, if necessary.

Upon her arrival at one of the villages, the researcher was met by a resource person (hereafter referred to as "community assistant") who helped her to find accommodation and then promptly took her for a walk around three villages, one of which he himself belonged to. On the way, he shared information about the people, their culture, occupations, and other similar topics. He also introduced her to the people that they met during the walk. Over the next few days, the researcher, accompanied by the community assistant, visited the three villages several times and met with two village heads, the village elders, healthcare workers, and other residents. It was important to meet with these people first as they would later help the researcher to recruit participants by spreading word about the study. It was also necessary to build relationships with them as they could provide information about the villages on the whole rather than just as individual residents. Having an assistant from the community helped facilitate these interactions as his presence helped instill trust in the study and the research process. Regular visits to the villages at different times of the day also allowed the researcher to meet with different people who she would later go on to meet several times during the data collection process. The geographical proximity of the three villages increased the visibility of the researcher and allowed for repeated interactions with same people who quickly became familiar with the researcher and her study objectives. Of the four villages initially identified, three lay on one side of the river and could be accessed by foot. Therefore, the researcher conducted the study in those three villages only.

3.6 Data Collection Strategy

Data collection in qualitative ethnographic studies usually takes place in stages or phases, and consists of participant observation, key informant interviews, and group interviews, among other methods. The *first phase* is that of "getting in" and establishing contacts/relationships with gate keepers and other influential members of a community (Richards & Morse, 2013). In this phase, the researcher largely lacks understanding of the community and the context, and therefore, data-making is generally restricted to more organizational tasks. During the study, the first phase began as soon as the researcher arrived at the villages and had the opportunity to walk around and meet with people. During this time, the researcher focused on familiarizing herself with the geographical layout of the villages, meeting with influential members of the community, obtaining demographic data for the villages, translating the consent script and interview guide into Hindi, initiating contacts with village residents, and field-testing the interview guide to ensure that the questions were relevant to the cultural context and understandable for the older population. It was also during this time that the researcher found out that all residents of the villages spoke Hindi. This ruled out the need to recruit a translator, made the translation of documents easier (with the input of the community assistant), and afforded the researcher greater flexibility and independence in building relationships and collecting data. During this time, the researcher consistently added to the memos that she had begun writing upon her arrival in Uttarkashi town; she also made field notes to record observations and interactions.

In the *second phase*, researchers and participants become more comfortable with each other, and the researcher begins to learn in-depth about the community. During this phase, data collection comprises informal conversations and observations, which lead to the identification of key informants and, sometimes, interviews with some of them (Richards & Morse, 2013). During the study, this phase occurred rather quickly in the villages. Informal conversations, several times a day, took place with a wide range of people. Very often, these were with groups of men and/or women who, together, would either knit, drink tea, or work outdoors around their homes. The residents were quick to accept the researcher's presence in the community; she was often invited by groups of women to sit and chat with them as they carried out their daily tasks. Frequent interactions such as these allowed the researcher to become familiar with the communities' daily routines (for example, women were mostly available during afternoons after having returned from the forests and performed household duties; men who ran shops preferred

to converse during late mornings when fewer people visited them), and plan her data collection strategy. This phase provided the researcher with the opportunity to interact with people of different ages and understand the topic of the study from different perspectives. During this phase, the researcher made extensive field notes, identified key informants, and contributed to the memos on a daily basis.

The *third phase* is characterized by cooperation and acceptance of the researcher into the community; data making also becomes most productive in this phase (Richards & Morse, 2013). During the study, the researcher used this phase to conduct in-depth interviews with key informants. The interviews lasted about 45 minutes on average. They were conducted in Hindi during times most convenient to the participants and at locations of their choosing. Going into this phase, the researcher had planned a timeline that would allow for a few days' interval between the scheduling and conducting of interviews. Most participants, however, did not feel the need to schedule meetings. If they were willing to participate, they preferred that the interview be conducted on the spot. This was more convenient to them as they were uncertain if they would be able to keep appointments at a later date. Consequently, the researcher sometimes conducted multiple interviews a day if she happened to meet multiple potential key informants during her daily visits to the villages. A few people preferred to schedule interviews, most notably the men who had shops, as well as most of the allied participants as they were located in different towns that the researcher had to travel to for the interviews. Otherwise, all interviews were conducted as soon as the researcher approached the residents. The community assistant accompanied the researcher for the first few interviews, but with language not being a barrier, the researcher undertook most of the subsequent interviews without the community assistant. However, in the evening of every second day, the researcher met with the community assistant to share what she had learned and to gain his perspective on the data collection process.

At the beginning of each interview, the researcher explained the objectives of the study and informed the participants of their rights as subjects of research in order to obtain verbal consent. Permission was also sought to audio record the interviews. The researcher then collected basic demographic information about each participant (this step applied only to the 25 primary participants) (see Appendix C for demographic information form). The demographic information form was filled in by the researcher based on the oral answers provided by the participants. For the interviews, the researcher used three kinds of questions to gather data: main

questions to address the research questions; probes to help manage and guide the interviews while giving the participants the opportunity to set the flow of the conversation; and clarifying or follow-up questions that arose during the course of the interview as a response to the information being shared by the participants (Rubin & Rubin, 2011). In addition, the researcher periodically re-confirmed the information that the participants had shared in order to ensure that the researcher had understood what was said in the way that it was meant to be understood.

The researcher made use of a semi-structured, open-ended interview guide to frame the conversations (see Appendix D for interview guide). The questions, however, were adapted to the context of the conversation to enable the participants to talk freely. The researcher and the community assistant (when present) made field notes at the end of each interview for future reference and analysis. The key informant interviews with the 32 participants provided the researcher with the opportunity to gain a deeper understanding of their problems, perceptions, and cultural beliefs. In this phase, the data collection process became more focused, and enabled the researcher to develop theoretical formulations.

The *final phase* of the data collection method is that of withdrawal from the field, and a focus on data analysis. Any further data that is collected is for the purpose of clarifying vague information, and substantiating and verifying previously collected data (Richards & Morse, 2013). Upon completion of this process, the researcher leaves the field to make the data ready for in-depth analysis. During this study, the researcher left the field to return to her university to translate and transcribe the interviews to make them ready for data analysis.

3.7 Field Notes and Memos

Field notes and memos are integral to the qualitative research process. Field notes include descriptive records of observations and interactions between the researcher and the participants, and include records of an individual's body language, their conversation style, descriptions of the interview location, notable objects, researcher's impressions, and other observational data that cannot be captured in an audio recording, but that help to create thick, rich descriptions of the study context (Phillippi & Lauderdale, 2017). In the data analysis stage, a researcher treats field notes as a data set to review, reexamine, and re-experience everything that has been written down, while simultaneously seeking to identify themes, patterns, and variations in this record. A line-by-line reading of field notes to identify common ideas and issues until data become repetitive is the best way to analyze field notes. This process of reviewing field notes in the

sequence that they were written allows the researcher to revisit and re-experience changes in relationships with participants, as well as assimilate the quality and quantity of information gained (Emerson, Fretz, & Shaw, 2011).

Memos are informal written accounts of daily activities that help a researcher to visualize what they have learned, determine the direction in which the study is headed, and identify modifications that need to be made to the research process in order to reach the study goal (Birks, Chapman, & Francis, 2008). Memos help the researcher to clarify their thinking process, engage with the data, explore meanings, and facilitate the progression of the study. Together, field notes and memos help the researcher to achieve a complete understanding of the data.

3.8 Data Analysis Strategy

The in-depth data analysis process began only after the researcher had left the field. Preliminary data analysis, however, had begun in the field as data collection and analysis are not necessarily separate processes in ethnographic research. In fact, on-going data analysis, aided by detailed memos and field notes, greatly helps inform research direction and future data collection strategy. Although it is desirable to have the audio-recorded interviews transcribed within days of an interview being conducted, the researcher did not have the opportunity to do so due to logistical limitations. Consequently, data transcription and translation into English were carried out by the researcher over several months after data collection had been completed.

All transcripts were translated, transcribed, verified, and de-identified by the researcher before in-depth data analysis could be undertaken. The researcher stayed as close to the original language as possible and retained specific terms and phrases from the original language to present the participants' responses in their own words. Multiple readings of field notes and memos, combined with close engagement with the interview data during the transcription period, had allowed the researcher to start a preliminary code book for data analysis. Once the transcribed interviews became available, the researcher uploaded them onto the qualitative data management software, *Dedoose*, to begin the coding process. Additionally, demographic information for all participants were uploaded onto the software to link this information with corresponding interviews and field notes to make complete datasets for each key informant.

The next phase, in-depth data analysis, involved extensive coding. In this stage, the researcher coded each interview to expand, modify, and refine the preliminary codebook (see Appendix B for codebook for data analysis). Codes are "summative, salient, essence-capturing,

and/or evocative" attributes that are assigned to the data by the use of symbolic words or phrases (Saldana, 2009, p. 3). Coding, however, is more than just labelling data. It leads the researcher "from the data to the idea and from the idea to all the data pertaining to that idea" (Richards & Morse, 2013, p. 154) to create links between data materials and abstract ideas. Coding has been described as the most important link between the data and the meaning that they convey. They are generated by the researcher to capture the essence of the meaning (Fereday & Muir-Cochrane, 2006). The first round of coding saw the creation of broad, overarching codes to capture the richest meaning and experiences of the participants. This process was undertaken at length and in great detail to encompass all the data, including those that did not seem relevant to the present study. This process allowed the researcher to engage with the data closely and arrive at the best possible "whole" (Fereday & Muir-Cochrane, 2006).

The broad, overarching codes were then used to derive themes that emerged from the data. Themes are common threads that run throughout the data. They take the researcher away from individualized data and towards concepts that help to make meaning of the data (Richards & Morse, 2013). This process allows a researcher to flag new ideas, explore and develop new concepts or categories, and pursue comparisons within the data. During the theme-building process, the researcher used the codes to create two schemas - "in the olden days…" (Figure 1) and "these days…" (Figure 2) – for a visual representation of the relationships and interactions between the various factors that made up the primary themes of the study. The two schemas reflect two different time periods that the participants compared and the various components within the two time periods that they identified as the building blocks of the final themes. While exploring themes that evolved and emerged from the data, the researcher extracted illustrative quotes to capture the essence of the themes, thereby allowing the readers a glimpse into the actual words, feelings, and experiences as described by the participants themselves.

3.9 Trustworthiness of Data

The term "trustworthiness" is used in qualitative research to establish credibility, transferability, dependability, and confirmability of data. Qualitative research is very context-specific and features small sample sizes that do not allow for generalizability of findings. Although not generalizable, the findings are phenomenologically informative and can be illustrative of similar experiences in other places and contexts. To ensure trustworthiness, the researcher used multiple sources of information (interviews, field notes, memos, observations) to

compare and contrast. During the data collection and analysis stages, the researcher sought disconfirming evidence, a process whereby researchers first establish themes and categories, and then search through the data for evidence to disconfirm the themes. This process strengthens the credibility and authenticity of the data (Emerson et al., 2011).

Additionally, interviews were conducted until data saturation was achieved. This ensured that no important information had been missed by the researcher while collecting data. The researcher also made field notes along with the community assistant and contributed to memos based on regular interactions with him. Additionally, preliminary coding of field data (observations, field notes) was undertaken with continuous input from the community assistant to ensure a uniform and collaborative data collection and coding process. Further, the researcher took care to periodically confirm information during the interviews to give the participants an opportunity to think about what they had shared and clarify information, if necessary, so that the data would be reflective of their experiences. These multiple measures ensured objective analysis and reporting of the data as a combination of such measures is generally used to enhance the credibility of qualitative research (Creswell & Miller, 2000).

3.10 Positioning of Researcher

I have spent many years living, studying, and working in the IHR and am familiar with the challenges that are being experienced by older adults in current times. My interactions with a wide range of people across several Himalayan states nurtured my interest in carrying out the present study. To avoid biases in my research activity, I undertook the study in a location that I had not visited previously and where I did not have prior relationships with the local population. This allowed me to undertake my research from a neutral standpoint. I also had the advantage of speaking Hindi, which is widely used by the residents of the villages in which this study was conducted. Being able to communicate directly with the participants rather than through a translator allowed me to work independently, build relationships, and enrich the data that I collected for the study. Finally, my position as a student researcher allowed me to interact with the local population in a way that may not have been possible if I were there for professional work or as a representative of an organization. All of these factors allowed me access to almost all residents of the villages and helped me to explore my research questions in depth.

Chapter 4: Research Findings

4.1 Introduction

This chapter presents the findings of the study, starting with a brief background of the people and villages, participant characteristics, and key overarching concepts of medicine and illnesses as understood by the participants of the study. The remainder of the chapter is then broadly divided into two sections: "In the olden days…" and "These days…" These two time periods are illustrated by their respective schemas, and reflect how the participants described their lives before and since major developmental work was undertaken in the region by the Indian government after independence in 1947, and particularly after the Sino-Indian War of 1962. The two time periods are made up of several components that the participants believe either promote, maintain or improve health, or cause illnesses, alter health seeking behaviors, and result in a decline in the overall health of individuals and society. The various components and their interactions form the primary findings of this study.

4.2 Brief Background of the People as Shared by Participants

Before 1962, there were two villages at higher altitudes along the Indo-China border in the geographical area where this study was conducted, in addition to the three villages included in this study. After the war Sino-Indian War of 1962, as military presence on both sides of the border intensified, the two higher altitude villages were evacuated and the residents moved to the villages included in this study. Today, all residents are well integrated and have three generations living together, permanently or temporarily. It was also after 1962 when the armed forces established bases in the region that roads, transportation, packaged food, communication, modern healthcare, and other amenities became available to the people.

In the early half of the 20th century, most of the now-residents of these villages and their parents/grandparents traded with Tibet. They did not have a permanent residence; they would spend six months of the year walking up the mountains from Rishikesh, a city in the foothills of the Himalayas, covering a distance of over 300 kilometers by foot, to the Tibetan border, and use the remaining six months to descend from the mountains. One their way up, they would carry wool, sugar, jaggery (centrifugal cane sugar) and essential grains to the cold deserts of Tibet, pay their taxes to the king of Tibet, sell their wares within blocks/villages allotted by the head of their caravan, and bring back salt, sheep, goats, and *pashmina* that they would sell in India upon their

return. Entire families, along with their possessions and their domestic animals, would travel together; children would receive an education from a teacher who travelled with the caravan.

After trading stopped in 1950 following the Chinese occupation of Tibet, and the now-residents had settled down in the villages mentioned earlier, life changed for the people as they began to establish homes, put down roots, and explore new occupations. Subsequently, people began to rear sheep; plant apple orchards; and set up small businesses such as grocery shops, tea and *momo* (Tibetan-style dumplings) stalls, small hotels for increasing numbers of tourists/trekkers, and mule services for carrying load up the mountains. Over the last seven decades, some occupations have remained the same (running small businesses), some have changed (with the availability of transportation, mules are no longer required), and some occupations are faced with imminent decline (working with sheep and wool). One aspect that has remained stable, however, is that people still grow their own food. The things that they cannot grow, they are able to buy from local stores that source them from bigger towns.

Village 1.

Village 1 is the main center for administrative activity in the upper regions of Uttarkashi district, and caters to the residents of eight surrounding villages. It is home to a dispensary, a post office, a bank, and a school. It houses staff members from the state agriculture, horticulture, and public works departments; the district police; the district crime branch; the forest department; and the Indo-Tibetan border police force. Additionally, it has a cantonment area for the Indian army. It is accessible by road, and is a popular transit point for tourists and trekkers who visit the region. The village and its surrounding areas are renowned for their apples; vast quantities of apples are exported every year. Most residents are engaged in subsistence farming of potatoes and kidney beans, and commercial farming of apples. Some people also raise cows. The village is home to 80-90 families, but only 70-80 people are permanent residents. Others have migrated to cities for education and employment. There are also between 100-150 workers from the above-mentioned departments that live in the village. There are approximately 100 houses; many are shared by multiple families. Most residents have winter residences at lower altitudes. Except for a 3-4 families that follow Buddhism, all others follow Hinduism. All residents speak Garhwali and Hindi; a couple of families speak Tibetan. The population comprises SCs, STs, and the General Category. Elections are held every 5 years to elect the Village Head; the state government allocates seats to represent the population composition.

Village 2.

Village 2 is located at a distance of approximately 1 kilometer from Village 1. The villagers are primarily a community of sheep herders who are famous for their knitted and woven woolen products. There are about 20,000 sheep in the village; there are also a few cows and horses. Additionally, residents cultivate apples for commercial purposes, and beans and potatoes for personal consumption. Some people find seasonal jobs through a rural employment scheme whereby the government guarantees 100 days of employment to an individual. People use the time and resources to engage in construction work around the village to repair fences and pave mud paths. Most of the population belongs to the ST category; there is also a smaller community of SCs, and a few people from the General Category. People speak Garhwali, Hindi, and Tibetan. They follow either Buddhism or Hinduism or both. The village has a monastery and two Hindu temples. It also hosts a multi-day *Dussera* festival every year. The population is made up of around 416 families. However, not everybody resides in the village as migration is common. Almost all residents maintain a second residence in a town at a lower altitude. There are 250 houses in the village; some are shared by multiple families. The village has a Village Head who is elected every five years.

Village 3.

Village 3 is located a little over 1 kilometer on the other side of Village 1. It is primarily a village of priests. Most residents are *Brahmins* and Hindus; there is also a sizeable SC population. The village is the winter home of Goddess Ganga whose idol resides in the holy site of Gangotri in the summer. Before winter sets in and Gangotri becomes inaccessible due to snow, the idol is brought down to the village amidst great fanfare to be worshipped and cared for by the priests all through the winter season. Apple cultivation and subsistence farming are the primarily occupations of the village. Some people also have cows. Many residents are vegetarian due to their religious beliefs. The village is accessible via a mud path from Village 1 on one side and a bridge over the Bhagirathi River on another. Like the other villages, the people of this village also move to lower altitudes in the winter, except for the priests assigned to work at the temple housing Goddess Ganga. The people of the village speak Hindi and Garhwali. The village has a population of around 680 individuals and around 125 houses. Similar to the other villages, elections are held every five years to elect the Village Head.

4.3 Participant Characteristics

Thirty-two participants provided primary data for the study – 25 primary participants and 7 allied participants (those who were named as healthcare providers by the primary participants).

Table 2. Profile of Primary Participants

Primary Participants	
Total number of participants	25
Gender; age range	11 men: 59-87 years of age 14 women: 55-79 years of age
Role	Village residents: 23 Hindu priests who lived in the villages: 2* *Hindu priests perform the roles of "allied participants" or healthcare providers
Scheduled Tribe (ST)	*Bhotiya*: 12
Caste	Scheduled Caste (SC): 5 *Brahmin*: 3 Sub-castes (*Rana, Negi, Ghataul*): 5
Education	No formal education:14 Class 8 and below: 8 Bachelor's degree: 2 Master's degree: 1
Religion	Hinduism: 12 Buddhism: 3 Hinduism and Buddhism: 10
Recognized herbal medicine practitioner	None

The twenty-five primary participants of this study were village residents (fourteen women aged 55-79 years and eleven men aged 59-87 years). Two of the eleven men were also Hindu priests. Priests in the villages have traditionally performed the role of healthcare providers. Therefore the two priests, in addition to being residents of the villages, also served the villages in their capacity as healthcare providers.

Twelve participants belonged to the *Bhotiya* tribe, five belonged to Scheduled Castes, three were *Brahmins*, and five belonged to sub-castes such as *Rana, Negi*, and *Ghataul*. Fourteen

participants had no education, eight participants had studied up to a maximum of class 8, two participants had a bachelor's degree, and one participant had a master's degree. Twelve participants followed Hinduism, three followed Buddhism, and ten followed both religions equally. None of the participants were recognized herbal medicine practitioners. However, all of them had traditional knowledge about common herbal remedies, and some of the older participants had vast amounts of knowledge of the same.

A total of seventeen interviews were conducted with the twenty-five participants. Of these, twelve interviews were conducted with individuals, three with couples or dyads, one with a group of three neighbors, and one with a group of four women. Two other interviews were also conducted with individuals, however, during the course of the interview the researcher realized that the participants did not meet the eligibility criteria of the study. Those interviews have not been included in the study.

Table 3: Profile of Allied Participants

Allied Participants (named by primary participants as healthcare providers)	
Total number of participants	7
Role	Tibetan *lama*: 2 *Vaidya* (Ayurvedic practitioner): 2 *Amchi* (TTM practitioner): 1 Village pharmacist: 1 Village Head: 1 (not a healthcare provider)

The allied participants included two Tibetan *lamas*, two *vaidyas*, one *amchi*, one village pharmacist (medical staff primarily responsible for dispensing medicine, but may also provide the services of a doctor in their absence), and one village head who was younger than age 55, and therefore, not included among primary participants. These participants were not required to meet the age and other criteria for participant selection. They were interviewed either because they were identified as providers of healthcare by the primary participants of the study or because they were able to provide comprehensive information about their village (inclusion of Village Head). Six interviews with allied participants were conducted with individuals; one was conducted with a dyad of allied participants.

All primary participants and most allied participants maintained two residences: a summer residence in the mountains where they spent 6-8 months of the summer and monsoon seasons, and a winter residence at lower altitudes or the "plains" where they spent 4-6 months of winter and spring. The interviews for all primary participants were conducted in their summer residences. The interviews for allied participants were conducted in various places based on where they were located for their work.

All primary participants lived part-time with their children in their winter residence where the children held jobs and grandchildren attended school. They moved to their summer residence without their children only if they were able to perform daily tasks on their own, or if they had a younger member of the family to accompany them. If not, they continued to reside permanently in their winter residence with their children even as they continued to maintain the family home in the mountains. All primary participants of this study were either physically able to live alone, or lived with children, and, in some cases, with their children-in-law in their summer residence for 6-8 months.

4.4 Key Overarching Concepts of Illness, Health, and Medicine

The different types of illnesses and medicines are themes that recur throughout the two time periods ("in the olden days…" and "these days…") discussed later in this chapter. In each time period, the nature of illnesses varied, and participants accessed different branches of medicines to address their health concerns. Participants also identified a wide range of factors that contributed to the time period-specific illnesses and their corresponding medicines. This section provides a broad overview of how participants define health, illnesses, and types of medicines. This information will enable a better understanding of the two time periods later in the chapter.

Types of illnesses.

The participants characterized and categorized illnesses in various ways: "small illnesses", "big illnesses", "new illnesses", and "illnesses of old age". These categorizations were dependent on factors such as severity of an ailment, availability of herbs and knowledge of homemade herbal remedies, typical length of an ailment, commonality of occurrence, and cause of illness. These factors together helped individuals and families to decide which line of treatment to seek. In the past, there existed two primary options: herbal medicine and folk medicine. Now, options include herbal (if available), traditional, folk, and modern medicines.

Small illnesses.

Small illnesses are generally characterized as *mamooli* (minor) or *halka-phulka* (light), eliciting little concern from an individual. They may or may not be considered as illnesses per se. They may be brought about by seasonal changes or the general climate of the region. Small illnesses are also characterized by their common occurrence. They have remained unchanged for generations; there is no ambiguity surrounding their cause (unless they do not get cured as and when expected); there are known herbal remedies to treat these; there is modern medicine available for these; and they affect all age groups. Small illnesses generally do not cause great anxiety or worry among the participants. They are the illnesses that the participants are most familiar with; they are also the most prevalent illnesses in the villages.

According to one participant, "…a cold…it happens when the seasons change…the water here is very cold. When the water changes we catch a cold. So we don't think of it as an illness." A small illness (*chhota-mota bimari*) is not considered an illness even though it is called an illness (*bimari*). Small illnesses affect all individuals and "get cured easily". They include cold, cough, fever, stomach ache, upset stomach, headache, and, sometimes, breathing difficulties while walking uphill. They tend to get cured even if people do not take medicine. According to a 59-year old participant talking about the older generations, "…even if you don't take medicines, after four days it will get cured. It is not necessary to take medicine. Many fathers will say, 'who takes medicine for cold?' No, they drink their own bitter concoction and get cured." One of the characteristics of small illnesses, therefore, is that they get cured even without medical attention. Some people resort to herbal remedies such as the bitter concoction mentioned above, some buy medicines from the pharmacy, and some let nature take its course.

Two participants pointed toward their stomachs and mentioned small operations, but were unable to explain beyond calling them *chhota-mota* (small, minor). One participant mentioned that "…sometimes, among women, the womb becomes bad." Although not considered an illness, a dysfunctional womb is nevertheless mentioned along with health issues that affect a small handful of women in the village.

Small illnesses are also those that affected people in the past and continue to ail them in the present. They are "normal", "basic", and "gradual" illnesses - the only ones primarily prevalent in the region. According to one participant, "there aren't any serious illnesses here. Normally, it is like someone gets wet and catches a cold; or in the winter, someone gets fever.

Just the normal things." Small illnesses generally do not cause great worry among participants. A few participants, however, felt differently. They were of the opinion that small illnesses may sometimes be indicative of bigger health conditions, and that leaving these unattended may, sometimes, have negative consequences on one's health. One participant cautioned: "these [small illnesses] are also illnesses. If one does not pay attention to these then they can lead to many types of illnesses…say you have fever, it can be TB [tuberculosis], cancer…all illnesses happen after an unmanaged fever..." This participant gives an example of how something like a fever may be viewed and treated like a common occurrence, but may have the potential to develop into something much bigger like cancer or tuberculosis. This view was echoed by another participant who said, "these are gradual illnesses. But sometimes if a cold or cough becomes serious, then many things happen." Both these participants were of the opinion that small illnesses, if not treated with due seriousness, could be the harbinger of greater ills.

Big illnesses.

Unlike small illnesses, big illnesses are characterized by the ambiguity that surrounds their cause and process. Although participants were able to name big illnesses, they were less likely to be able to explain how they came about or pinpoint exactly what the illness was. Big illnesses are also those that may actually be considered illnesses, as opposed to small illnesses that many people may not necessarily consider being illnesses. According to one participant, "illness is some major problem in the body, say somebody has jaundice, somebody's liver goes bad, somebody gets TB, cancer, these are illnesses." Typically, big illnesses "happen inside" the body such as in "the kidney, lungs, and heart". They are believed to impact the quality of life and longevity of people. According to another participant, "there should not be any illness inside. That is the main thing. If something goes wrong inside, then that person will live fewer years." In most cases, the location of an illness seemed important for it to be characterized as an illness first, and then specifically as a big illness. Generally, if the internal organs of a body are affected, an individual may be said to be experiencing a big illness. Big illnesses are considered to be contemporary and recent, and may be caused by a number of factors. These are discussed in detail in the time period "these days…"

Additionally, big illnesses are typically those for which there are no known herbal remedies or indigenous medical knowledge. Consequently, they are closely linked with new illnesses for which people almost always seek modern medical treatment and, sometimes,

traditional treatments instead of herbal medicine. Some big illnesses named by participants included kidney stones, tuberculosis, cancer, heart disease, diabetes, and stroke. However, the participants stressed that these illnesses were not affecting the people of their villages or even in their region. Instead, they were beginning to hear about these considerably more frequently in recent times. Participants also shared that these diseases were not really affecting the older populations of the villages. According to one participant, "there are many types of illnesses that people suffer from. Some people may have illnesses in the stomach, some people lose their arms or legs, some people have breathing illness. It seems that more young people than old are getting sick." It is worth noting that although big illnesses are generally absent from the region in which this study was conducted, the few people that had been afflicted by these were members of the younger generation.

New Illnesses.

New illnesses are characterized by the limited knowledge that people possess about them and the fear or worry that they generate in the minds of people. They are not illnesses that the participants or their ancestors ever experienced, and therefore, there are no herbal medicines or indigenous medical knowledge to treat them. New illnesses, like big illnesses, include tuberculosis, dengue, cancer, tumors, stroke, heart disease, diabetes, hypertension, and other similar lifestyle diseases that adversely affect one's quality of life and reduce life expectancy. Participants have become aware of these illnesses only in the last decade or so. According to one participant,

> Earlier there was no cancer, in our times. Then this thing called blood pressure was never there. We didn't know about any of these things. And, what is that called - high attack or is it heat attack? We had never heard of it in our time, when we were young. We never heard of our forefathers having such illnesses. We didn't hear of medicines - there was neither medicine nor did we ever hear of such things. Now we hear of strange things. There are varieties of new medicines and also varieties of new illnesses…For the last 8-10 years we've heard about [heart] attacks. We didn't have this in the earlier days.

The absence of such modern diseases in earlier times was a common refrain among the participants who repeatedly mentioned that "[they] didn't have all this before; [they] didn't have anything". The occurrence of new illnesses was further illustrated by another participant who said,

> Dengue, for 1-2 years, it is a fever that is killing people. In our mountains nobody is dying of it. But in the plains [lower altitudes] they are. Based on these things medicines are coming out. Then, last year, a new illness came about. What is it called? Something like kidney bladder. Now medicines are coming out for this. In our times it was not like this.

All participants contrasted the illnesses of before with those of recent times. They mentioned that illnesses earlier would of the minor type, however, "…these days everything is *bhayanak* [dangerous/fear-inducing]." Modern diseases almost always create an information gap among participants who have traditionally been knowledgeable about the causes, processes, and cures of common illnesses. This gap in the understanding of new diseases leads to uncertainty about health issues among the older generation and forces them to use unfamiliar types of medicine.

The views of the participants regarding the rapid increase of new illnesses were also corroborated by their folk and traditional healthcare providers. According to a *lama*, "earlier they [people] did not really fall sick. There was not much of this [new illnesses] earlier…people did not take so many medicines either. These things are happening more now." The *lama* reported seeing more people seeking help to treat new illnesses now than ever before. A *vaidya* was also of the same opinion when he said, "…people did not know about things like hypertension. They didn't know about sugar [diabetes]…these never happened." The advent of new illnesses has not only impacted the health-seeking behaviors of most participants, but has also influenced the roles of traditional and folk medicine practitioners. As new illnesses emerge, traditional and folk medicine practitioners must know where to direct their patients for help.

Although almost all participants expressed similar sentiments about the relative lack of big or new illnesses in the past, one participant countered these by saying,

> Why would there be no illnesses? Of course people would get sick. Earlier illnesses could not be diagnosed. People would not know what illness they had. These days there is science; it has progressed. If something happens to me, they say "get a test done, get everything tested", so the illness gets diagnosed and they say "this is what has happened to you, get treatment for the full thing". Earlier

> people would depend on herbs, and god willing if the medicine worked, then good. If not, then it was a problem, no?

Notably, this person was one of the younger participants of the study. He was also one of the only two people with a bachelor's degree. And although he was a resident of the village, he spent part of the year in the biggest town in the district at his winter residence where he owned a woolen garments shop. This may be the reason why he differed from the other participants' views. The two other participants with higher education, however, were of the same opinion as the rest of the participants.

New illnesses, as a result of their newness, are often not understood accurately and may consequently be attributed to incorrect causes. For example, one participant shared that,

> Nobody works safely here because we are sheep farmers, we work with wool but we are not successful in protecting ourselves because the fiber that flies around goes inside through our breath. What that does is damage the lungs of people. That is why, very often, for those who work with wool, you will often find that 2% of people will complain of TB.

This participant believed that wool fiber was the cause of tuberculosis among a section of sheep farmers in his village even though his and the other farmers' ancestors were sheep farmers for generations, and tuberculosis is considered a new illness in the region. The *vaidya*, upon being asked about this participant's comment remarked,

> So, what happens is that if the fiber goes in, it will lead to asthmatic conditions, not tuberculosis. Tuberculosis is there due to excessive consumption of alcohol or tobacco…fiber will not cause TB. It is poor hygiene…that is also a cause of tuberculosis….it [fiber] will definitely lead to asthma, but not tuberculosis because tuberculosis is a bacterial disease. Until a bacteria affects, it won't happen. And the cause for that is either poor immunity or poor hygiene that leads to bacteria.

This is an example of how knowledge gap about emerging health concerns may result in incorrect association of cause and effect, and influence the health behaviors of individuals. Such knowledge gap may also be seen in the opinion of the same participant who earlier mentioned the existence of undiagnosed diseases in earlier times. He said,

"TB happens…it does not need much treatment". Views such as this may prevent an individual from seeking timely medical treatment.

Illnesses of old age.

Illnesses of old age are considered neither small nor big nor new. They are just illnesses or changes that affect people as they grow older. They are expected and accepted as normal accompaniments to old age. As one participant said, "what will happen to older people? Nothing happens to them. And even if something does, it is fine [understood to be normal occurrence, therefore does not alarm the individual or their family members]". These illnesses do not create fear or worry among people because, "once their time is up, and they have become old, then they have to go, no?"

Illnesses of old age may be described by their names, for example, "...knee pain, because in our youth we work with wool, we spend a lot of time in water…we wash [wool], and we scrub with the feet, so that is why the legs are used more." Or, as another participant said,

> Here people have breathing difficulties. The altitude is high, no? There is breathing trouble, so usually *damma* [or *dammi*, meaning breathing difficulties or asthma] type things due to high altitude. People also have BP [blood pressure], I have BP as well…but we have to live here. People say "go down, people with BP should not live at high altitudes" but this is my primary residence. I have children in [cities], but this is the only place where I feel good.

The views of this participant were similar to those of almost all others who also mentioned experiencing better health in the mountains compared to towns/cities at lower altitudes. The pharmacist at the dispensary that serves the residents of 8 villages weighed in by saying that, "older adults don't have much….mostly it is BP…there are more BP patients here…those with hypertension…and there are some with respiratory problems… [and] things like pain…it is common for people to get arthritis at this age." All the health concerns mentioned by the participants were either related to the altitude that they inhabit (breathing difficulties while walking uphill) or to their physically strenuous traditional lifestyle (shepherding sheep up the mountains, working with wool standing knee-deep in water, carrying heavy loads of grass and wood on their heads/backs). The illnesses of old age were few in number but widely prevalent among the older population.

Participants also shared some physical symptoms that they experienced as they continued to age, including the changes that they felt their bodies undergoing. According to one participant,

> Sometimes the ears gets closed, sometimes the mouth gets closed, some people sleep little, some people - when they wake up - they want food. Some people feel more hungry as they grow older…they eat small portions and then feel hungry, then again eat a little, then again get hungry.

For this participant, like some others, the physicals symptoms of aging were not different from illnesses of old age. As long as the physical changes prevented an individual from functioning optimally, it was an illness of old age. Another participant shared,

> One doesn't remember things. In the old days, even if you weren't educated, you could do business and remember things. Now, in old age, you keep something somewhere and then immediately wonder "where did I keep it, where did I keep it?" You forget things. There's no memory. Every day one becomes *kamzor* (weak). Sometimes ears don't listen, somebody's eyes don't see…then you feel that "now I'm old…won't live long".

Although most of these symptoms of deteriorating health are not illnesses per se, they are indications of the transition to a more finite stage of life. This stage was most often met with acknowledgement and acceptance by the participants.

Cognitive diseases, typically associated with advanced age, are relatively rare in the region. Although many participants mentioned forgetfulness, no other cognitive disease (e.g., dementia) or their symptoms were mentioned. Moreover, because forgetfulness is an accepted part of the natural progression of age, it is not necessarily categorized as an illness. No participant reported being unable to function independently due to cognitive issues.

Similar to cognitive illness, psychological or mental illnesses are also very rare in the villages. No participant reported experiencing a mental illness (e.g., depression); they also did not mention anybody else in the village that may be suffering from a mental illness. As a result, they may be unfamiliar with the wide range of mental diagnoses, and use the umbrella term "mad" to mean anything out of the ordinary. According to one village resident,

> Now, as far as I know, very few older adults experience psychological illnesses. Here people can roam freely, do things freely, older adults here…can't get mental illness because the air and water are clean. All around them everything is open. So, they won't get mental illness. People can roam around, they can see the

> nature, the mountains, the snow, so the heart will stay happy, no? Mental illnesses are not really prevalent here…if someone, in a very rare case, gets it, then it is a different story. But this is a peaceful place…I have seen very few people, older people...people might say that he/she has gone mad, but in a rare case if 1 out of 90% goes mad then it is different. But 99% of people don't go mad.

As is evident from the quote above, the terms "mental illness", "psychological illness", and "mad" are used interchangeably by the participants because they are uncommon in the region and awareness about them are low. Most participants agreed that "everybody stays *tandurust* [strong and healthy] here, old people, everybody." In general, whenever participants mentioned illnesses, they almost always referred to physical ailments.

Some common concerns of old age shared by participants included: forgetfulness; decline in memory; weakness; reduced sleep; decreasing body mass; increased worry/tension with the realization of limited time ("they think too much – what will happen? How will things happen? What needs to be done?"); poor eye sight; poor hearing; low hemoglobin ("they eat less, so blood doesn't get created"); cough; breathing difficulties; tooth ache; hand, leg, back, and knee pain; weakening of nerves due to reduced water in the body/bloodstream; reduction in appetite; softening of voice; discomfort with loud noise or television ("too much noise makes the mind spin"), and the overall slowing down of the mind ("things don't enter the brain anymore") and body when moving around or performing household tasks. In the last 5-7 years, some people have experienced sudden numbness in the limbs that does not get cured and that the participants know little about ("now this is a new illness, who knows what it is?"). A number of the above-mentioned issues are related to the process of aging and are not illnesses per se, but they contribute to the overall slowing down of the body and lead to diminished health and functioning. For this reason, the characteristics of old age have been discussed together with more specific illnesses of old age.

Health and illness.

For the participants, good health was a product of the interaction between several factors including diet, lifestyle, traditions, environment, and social support which, when they complement and reinforce one another, promote good health, allow for safe and efficient management of small illnesses, and minimize the occurrence of big illnesses. According to one participant, "good health would mean not having any illness…if one's health is fine, there's no

illness or sadness…if someone has illness and sadness then can the health be good?" It is interesting to note that health status may influence the mood or emotions of an individual to the extent that they may be reflective of the person's health. It is not clear if the participant meant anything else when he mentioned "sadness", such as depression, but the relationship between physical and emotional health seemed to be strong.

Good health was also characterized by one's ability to perform work. As one participant said, "now I don't have any illness. I am healthy, I am eating and I am working. I can do everything. I can work. I can carry grass." Good health allows participants to remain happy and live independently in their summer residences in the absence of younger members of the family. As the participants' lives are almost exclusively reliant on consistent physical labor, good health is necessary for them to be able to perform daily tasks such as cooking; cleaning; washing clothes; caring for animals; walking everywhere, often uphill; and cutting, collecting, and carrying grass, firewood, and fodder from the jungles.

Types of medicines.

All participants had access to a range of medical traditions to treat the various categories of illnesses described in the section above. The different types included herbal, folk, traditional, and modern medicines. Each type had a pre-determined role in the lives of the participants; their usage was dependent on a combination of factors including nature of disease, dominant cultural norms, personal preferences, and access to traditional systems and modern conveniences.

Herbal medicine.

Herbal remedies are among the oldest forms of healthcare used by the participants and their ancestors. These are made up of potent medicinal plants – some commonly available; others requiring a thorough search – found in the local jungles that have traditionally fulfilled both medicinal and nutritional requirements of the local population. Some common herbs used by the participants and generations of their ancestors include: *Atis (Aconitum heterophyllum), Kutki/Kurai (Picrorhiza kurroa), Saalam panja (Dactylorhiza hatagirea), Archa (Rheum australe), Mulethi (Glycyrrhiza glabra), Chora (Angelica glauca), Bhojpatra (Betula utilis), Thuner (Taxus baccata), Aamil (Hippophae), Guchchi (Morcella esculenta),* the gum and bark of *Deodar* trees *(Cedrus deodara), Ladu* grass (scientific name unavailable), and a substance called *Sangrap*.

The herbs, used to treat common small illnesses, were consumed in different forms depending upon the purpose for which they were being used. One participant shared,

> These were the herbs that we boiled, cooked - *atis, kurrooa* - for fever. It is very bitter, that is why it is called *kurrooa* [sounds similar to the word for bitter]. *Atis* is also bitter and pungent. It is used for fever. If somebody had fever, people would advise to grind *atis, kurrooa*, boil it and make the person drink it like juice, or eat it and then drink water afterwards. So it would completely bring down the fever, easily.

The use of the two herbs was very common in earlier times; they are also in great commercial demand in current times. Another participant shared,

> *Ladu* is a grass that is used as a *chonk* [tempering], like onions that are used as *chonk* for *dal* [lentils], for *sabzi* [vegetables] etc. *Chora* is grated and added to tea, like we do with ginger. It is good for cold and cough. It is good for health and also improves the taste.

Boiling, grinding, sautéing, and grating were some methods that were used to consume medicinal herbs. Other medicinal uses included *archa* for wounds, *mulethi* for cold, *saalam panja* for burns, *sangrap* for broken bones, and *deodar* for its overall healing properties. These were either applied on the skin/wound or ingested with water and/or food for their curative properties to work optimally.

The medicinal properties of most herbs were also common knowledge among people who were able to treat small illnesses at home without consulting with herbal medicine practitioners. According to one participant,

> No, there was nothing like that [herbal medicine practitioners]. Now, people know that if they eat this then this will happen. Everybody knows about herbs, the main plant roots – *atis, kurrooa, saalam panja* etc. Almost everybody knows about them…everybody says that taking *sangrap* will do this - if a cow broke its leg or a child broke his leg, people would make them eat *sangrap*. And it would cure it.

Sangrap was not available in the jungles and almost always had to be bought at the market. According to the participants, it is not available anymore. Another participant, explaining the benefits of *chora* as an expectorant, explained,

> Even a baby, one that drinks milk…it is hard to feed them medicine but when they catch a cold, if you put some *chora* in fire and, once it starts smoking, direct the smoke towards the child, put some on the nose, chest, etc., it will definitely cure the cold. Like people

> say *balm ka bhaap lo* [inhale the vapor of a balm], we would inhale the smoke of *chora*. This is for children, small children. It was very important. It was a very good thing. The thing with these medicines is that they might cure gradually but they won't make an illness worse.

In the past, due to the relatively narrow range of illnesses that affected people, knowledge about those illness and their cures would be passed down from the older generations to the younger generations so that unless someone required special attention, everybody knew how to treat and cure themselves and their family members. This self-sufficient nature of the participants' healthcare system is being severely challenged by the emerging big and new illnesses.

Medicinal plants also often enhanced the nutritional profile of the participants' food intake, sometimes without their knowledge. These, in all probability, also acted as preventive measures against big illnesses. For example,

> Like *thuner*, now it says in books that if one consumes *thuner* they won't get cancer. But we used it instead of tea leaves when tea leaves were not available in this region. There were no facilities before; we hardly got to buy anything. Now this is a cold area, we can't live without tea. Isn't it? So we would take the bark, dry it, and that would give the color of tea. Maybe that is why we've never had such dangerous diseases…there is another priceless medicine here in the mountains, especially where the height is more…that we call *aamil*, the scientific name given to it these days is sea-buckthorn…now, we've always used them, from long ago, our elders used them, we used it commonly to make *chutney* [condiment]…so, we did not know much about it, but these days we're hearing that it is good for many things.

Other herbs and spices mentioned by the participants included wild cumin native to the mountains, carom seeds, and turmeric. All of these, although used as spices for their flavor, were also used to treat indigestion, stomach ache, vomiting, and for overall good health.

Herbal medicine has been the backbone of rural healthcare systems for millennia, and continues to be recognized for its health benefits even today. Herbs grow in the wild in a complex ecosystem; they are freely and abundantly available; they are safe to use (provided people know what they are consuming); they generally have little to no side effects; and they are known to cure diseases at a systemic level over a period of time. In more recent times however, international recognition of various herbs endemic to the Himalayan region has placed a heavy

strain on their natural regeneration as demands for complementary and alternative medicines continue to rise.

Folk medicine.

If the herbal medical system is based on common, transferable knowledge about diseases and medicinal plants, folk medicine is inherently reliant on people's fear of and faith in the unknown. It may take on myriad forms and promote or denounce various natural and/or supernatural elements, be practiced in unique ways in different places, or be an individual's first or last resort, but no matter how it is used or dispensed, it demands complete, irrevocable faith in the process and outcome. Unlike other forms of medicine, it is hard for the folk system to succeed in the presence of doubt and rationalization. Interestingly, even those with reason enough to question the methods of folk medicine, often end up receiving "proof" of the efficacy of this system through the performance of unlikely miracles. As a result, the folk system of healing remains a dominant branch of medicine in the villages to this day.

The folk medical system in the villages selected for this study was supported by 4 pillars: 1) praying to and asking questions of *devi-devtas* (god-goddesses) through the humans whose spirits are temporarily possessed by those gods and goddesses during religious ceremonies and festivals, 2) praying to and asking questions of the village *doli* (a narrow wooden palanquin housing the village deity, carried by specially chosen bearers during religious ceremonies and festivals), 3) asking the *lama* at the local *Buddh mandir* (Buddhist temple) to perform a *ginti* (counting) ceremony – casting of die and interpreting results from religious texts written by *lamas*, from the annually-published astronomical almanac (*panchang*), and from a book published every year by *amchis*; and 4) offering prayers to the *gram devta* (village god). The first three options always require one or more mediators between the individual seeking help and the higher power. The fourth option may be carried out by an individual; it may also be carried out with the help of the village priest.

Devi-devta puja (god-goddess worship): The residents of the villages follow a set of gods and goddesses who they offer prayers to and hold festivals for all year around. The primary gods for them are *Duryodhana*, *Arjuna*, and the other four *Pandavas*[2]; goddesses include *Draupadi*[3]

[2] Characters from the Sanskrit epic *Mahabharata* - a narrative of the war between the *Pandavas* and the *Kauravas*. Hinduism draws heavily from the *Mahabharata* as well as another major epic, the *Ramayana.*

[3] A female protagonist in the *Mahabharata*.

and Goddess *Ganga*[4]. These gods and goddesses (except for Goddess *Ganga*) do not have their own temples and are not believed to reside within any idol or image. Instead, they are invoked by their believers to descend upon and temporarily possess the spirits of humans of their choosing to offer advice, direction, and solutions to life's problems. The residents of the villages also follow other Hindu gods and goddesses and their myriad *roop* or *avatars*[5].

The possession of human spirits by gods and goddesses has been witnessed in the villages for a very long time. Those who have been possessed once are the "chosen ones" who continue to remain a conduit of the gods and goddesses till they die. As a result, most of the conduits in the villages are older men and women. As and when the older generation passes, younger members of those families or the village "get chosen". Possession of the spirit is indicated by the individuals entering into a trance-like state for a period of a few minutes during which they are unaware of their surroundings. It is during this brief period that people who are ailing, or their family members, ask questions about the cause of a new or persistent illness and possible cures for said illness. The conduit, still in a trance, answers the questions by throwing grains of rice up in the air and catching them back again. The number of grains that he/she is able to catch determines the answer that they provide to the question and the treatment path that the individual and family members will eventually follow.

During major religious festivals, such as *Dussera* at the time this study was being conducted, the gods and goddesses are worshipped over a period of time (nine days for *Dussera*) during which the conduits dress in special garments (men in white; women in green for *Dussera*) and wait for the gods and goddesses to grace the celebrations. Conduits, when possessed, may dance, walk on burning coal without getting burnt, and even lick hot iron rods without burning their tongue (these are also accepted as proof of divine possession). The dance of the *Pandavas* (the conduits) or *Pandava nritya* is attended by all villagers every day. *Dhols* (drums) and singing accompany these dances. It is during these celebrations that new members are "chosen" as conduits when they suddenly enter a trance-like state. From that day onwards, the new (usually younger) individual is also recognized as a conduit. When people fall sick and need to ask questions of the gods and goddesses at a time when no major festival is on-going or

[4] Goddess *Ganga* is personified by the sacred river, the *Ganges*, which originates about 45 kilometers above the villages in the snout of the Gangotri glacier. The *Ganges* is also called the *Bhagirathi*, and the villages lie on the banks of this river. Goddess *Ganga* is revered in the region by people of all faiths.

[5] Hindu gods and goddesses appear in many different forms or *avatars* in different parts of the country. Each of their forms goes by a different name. Goddess Ganga, for example, has 24 names.

imminent, the recognized conduits of the village are requested to attend special *pujas* (religious ceremony) in the hope that their spirits will be possessed and that they will be able to answer questions and provide direction. This process is followed not just for illnesses, but also for other issues such as household matters and marriage alliances.

Doli puja (worship of the village deity housed in the palanquin): A *doli* is made up of two horizontal, parallelly placed wooden or bamboo poles at the center of which is seated the village deity or another god/goddess that the villagers believe in. This *doli* is carried on the shoulders by two specially chosen bearers – one in the front and one at the back – who must hold on to the *doli* when it starts to answer questions. In addition to the bearers, there are specific people who can communicate with the *doli* and interpret its actions when it provides answers or guidance. As a general rule, an individual tells an interpreter what they want to know, and the interpreter stands in front of the *doli* to ask the question in a way that answers can be interpreted. The *doli* is said to use its own divine energy to answer the questions by either pressing down upon or turning on the shoulders of the bearers. The interpreter then tries to understand the message being conveyed by the *doli*. This message is relayed to the person seeking help, who then follows the guidance of the *doli*. A *doli*, like the *devi-devtas*, can be approached for help and guidance for a wide range of issues including illnesses, warding off an evil eye, settling disputes or making decisions about building a house on a particular piece of land. The *doli* is kept in the village temple and is brought out during festivals, such as the aforementioned *Dussera*; it may also be brought out on special occasions when someone needs its assistance.

Ginti (counting) ceremony: *Ginti* or counting numbers on the roll of a die is performed by a senior Tibetan *lama* (*Guruji*) at the local or the nearest Buddha temple. An ailing individual or their family member usually approaches the *lama* and shares their problem. The *lama* then schedules a day and time to conduct the counting ceremony. On the specified day, the *lama* casts a die or *mo* and interprets the results by reading from religious texts or *shastras*. This process is repeated two or three times and requires the *lama* to meditate on the interpretations before relaying them to the individual. The interpretations can tell the *lama* what aspect of the individual's life needs divine attention to restore balance and peace. An individual is believed to be made up of five components: *sogden* (life), *lugden* (health), *mwadhen* (power), *lungden* (fate or *kismet*), and *lahden* (soul or spirit). The interpretation of the numbers and corresponding texts helps the *lama* to determine which of these five components has been affected in an individual

(for example, the *lahden* or spirit may have been disturbed/scared by a sudden loud noise and left the body temporarily, leading to the individual feeling anxious or restless). This in turn determines the rites and rituals that need to be performed by the individuals in their own capacity (such as the chanting of *mantras* for a specified period of time) and those that must be performed by the *lama* at the temple. For rituals that must be performed by the *lama*, a specific date is set for a collective ceremony for the entire village. Five such dates are set every year to address the aforementioned five components that make up an individual. All village residents are invited to attend the ceremony that pertains to their circumstances. At the ceremony, there are provisions for every individual scheduled to attend so that everybody is able to benefit from the prayers. In special circumstances, the *lama* may conduct this ceremony for individuals at their request. The *Ginti* ceremony and subsequent rituals may be carried out for various reasons including health, marriage, fertility issues, education, and job prospects.

Offering prayers to gram devta (village god): Religion is closely tied to the lives of the people in the villages, and every village has its own god or goddess who is considered the *gram devta/devi* (village god/goddess) or the *mukhya devta/devi* (primary god/goddess). The village god/goddess is revered by all and have their own temple. Daily prayers are scheduled and offered to the god/goddess by the temple priest; special prayers are offered during religious ceremonies and festivals. All individuals are free to visit the village god/goddess at any time of the day. They may personally offer prayers with flowers, incense, and fruit; they may also hand them to the priest and ask him to offer them during the day's scheduled prayers at the temple. Afterwards, they may collect *prasad* (food offered to the Gods during prayers and later shared among devotees) for themselves and/or their families/friends/neighbors. Villagers may offer daily prayers or request the priest to hold special ceremonies at the temple to help cure illnesses, ward off the evil eye, appease the gods of specific planets, or for general health and prosperity.

One participant aptly stated, "…this land in Uttarakhand, [is] *dev bhoomi* [the land of gods and goddesses]…down in the plains there are big hospitals. But the system here is that if people get sick, they pray to gods and it brings about an improvement in their health." Another participant shared, "[folk medicine] is our advisor…our healer…and astrologer. It tells us everything. That is what we believe." The folk medical system of the villages can be summed up in these quotes that demonstrate that people often rely on divine powers rather than medicine to treat illnesses and improve their health. Moreover, as a result of multiple fruitful interactions

with the folk system in the past, people feel certain that this system will continue to deliver the results that they seek.

Traditional medicine.

The traditional medical systems prevalent in the region include Ayurveda and TTM. The villages did not have recognized practitioners of either Ayurveda or TTM, but people visited practitioners of these in bigger towns and cities at lower altitudes when needed. Traditional medicine was used by the participants primarily to treat chronic pains and aches such as arthritis and other joint-related diseases. According to the participants, traditional medicines generally take longer cure an illness, but once addressed, the illness is cured from the root at the very systemic level. One participant with breathing difficulties and shoulder pain from a ladder fall shared,

> It [TTM] cures very slowly, not immediately. Here, medicines from the government hospitals cure immediately and then it'll go back to square one. But not this [TTM]. This cures very slowly; finishes it [the illness] from the root. You have to take the medicine for a year or two, continuously. And his [TTM practitioner's] medicines are also cheap…now it has been a year that I have been taking the medicine. Now all the pain is gone. It is fine. I have breathing trouble sometimes, especially when I move fast, but otherwise it is fine. Now, this obviously happens somewhat in old age.

This participant had previously visited several modern medicine doctors who had either prescribed him medicine or asked him to exercise/do physical therapy due to lack of treatment for his ailment. However, when nothing helped, he visited the TTM practitioner who cured his shoulder pain over the course of a year.

The objective of traditional medicine is to restore balance and harmony among the various organ systems that support the human body. As a result, the treatment for a disease in one part of the body may be effected in another seemingly unrelated part of the body. An Ayurvedic practitioner shared some insight into the treatment of paralysis:

> …say someone gets paralysis or a sudden attack. These days hypertension in on the rise, diabetes is on the rise, so say they simultaneously have a paralytic attack…half-side [one side of the body]…We use *Panchakarma*. It takes time, but it cures it….For arthritis and all joint-related diseases Ayurveda and *Panchakarma* give very good results…it cures diseases, not [just] manages. If people come in the early phases…suppose there is a

> paralytic patient, if they come at a very early phase, they will be cured completely. But those who come in the late phases, say many years have passed, then that becomes difficult. So, in that case we maintain the disease.

Panchakarma or "five actions" is a medically directed and supervised deep detoxification process that strengthens the immune system and corrects imbalances within the body. It is used to treat a very wide range of illnesses through highly individualized treatments.

Traditional medicine does have certain limitations, and the practitioners are well-aware of these. These limitations mainly pertain to the treatment of new and big illnesses, and practitioners have now taken on the role of guiding and directing their patients to appropriate medical systems for treatment and cure. As another Ayurvedic practitioner stated,

> …in the initial phases when a patient comes in for TB, we will recommend modern medicine. In the latter phases when they want to overcome it, they can take Ayurvedic medicine…when a patient is very hypertensive or is a diabetic and everything is out of control, then initially we'll go with modern medicine. Then once it comes under control, we switch them to Ayurveda…Ayurvedic medicine takes time. So, say their BP is 200/110, and we try Ayurveda and it doesn't come down, instead, the person gets a paralytic attack, then their faith will also end, no? That is why it needs to be maintained first, then they come to us…we have to see the betterment of the patient. We can't insist that "we have Ayurveda so we will only give Ayurveda" because in doing so the patient might get impacted. Now, for diabetes, if the fasting [reading] is 300, and we keep administering Ayurveda, it will damage all the organs. So, first we have to bring everything under control, and then we can go for Ayurveda.

The practitioners of traditional medicine, therefore, not only study their own medical systems that have evolved over thousands of years, but also keep abreast of developments in the field of modern medicine to help patients to deal with new illnesses. The traditional medical systems of TTM and Ayurveda continue to be an integral part of the healthcare services available to older adults in the region. The holistic healing abilities of these systems propel people to seek out prominent practitioners in big cities or neighboring states and wait patiently over a long period of time for illnesses to get cured.

Modern medicine.

Modern or English medicine is the most recent type of healthcare to become available to the residents of the villages. It is widely promoted by the government that runs health camps; creates awareness about new and big illnesses through television/radio advertisements; recruits and trains grassroots healthcare workers; distributes free medicines; and promotes campaigns against polio, malaria, AIDS, and other health concerns. Modern medicine has seen rapid expansion in the region; its acceptance, however, varies among individuals. According to one participant,

> Now these medicines, they are not medicines. They mix poisonous things in them. That is how diseases get cured so easily. Earlier, medicinal herbs did not have poison. They would cure illnesses from the very root. These medicines will provide relief for some time and then they [people] will suffer from some new illness.

Although the participants had been exposed to modern medicine for a few decades, people are still reluctant to trust them. Another participant shared, "English medicines suit some people and do not suit others. Say you suddenly get a headache and take a Disprin, it cures the headache but then you catch another illness, then what does it achieve?" Many participants echoed similar thoughts about modern medicine; they believe that "it has become fashionable to take tablets" in modern times. Some feel that modern medicine has gained undeserved attention because it does not have the same curative powers as herbs. In fact, modern medicine would not exist if not for medicinal herbs. As one participant mentioned, "medicinal herbs are still used. All these medicines that are made by the government, they are all made with medicinal herbs. They mix things like powder and make medicines from them." According to the participants, this mix of other substances with medicinal herbs renders the new medicines "poisonous" or effective only for certain ailments and not for overall cure and good health.

Not all participants agreed, however. Some had never used herbs, primarily because their family occupation did not necessitate regular treks up the mountains where herbs grew. Instead, these participants relied more heavily on traditional and folk systems. More recently, they included modern medicine as another option. Often, younger generations played a significant role in influencing the views of their families and communities regarding modern medicine. One participant mentioned,

> I'll go to the hospital first because people believe more in hospitals, not in herbs because doctors can cure a dying person. They can operate and cure people. Most people believe in doctors. They don't believe in herbs that much. They use it [herbs] when they don't have an option. They fall very sick, have no option so they use it, and then get well. But nowadays many people believe in doctors as well.

This participant, like many others, was conflicted about the use of modern medicine. She was aware of the efficacy of herbal medicine, but used modern healthcare facilities due to easy accessibility and quick cure.

Opinions about modern medicine may also be affected by the emergence of new and big illnesses. As traditional systems do not have treatments for these and modern medicine is seen as the best defense, people may believe that their traditional systems have become ineffective. As one participant mentioned,

> People also these days do not survive without English medicine, operations are done…if they die, they die, if they live, they live. The dangerous illnesses can take a person from where to where. Earlier older people would live to over a 100 because of herbs. Now there is no surety about what age people will die.

To most people, herbs were more than just medicine. They were integral to overall good health and longevity. One participant upon being asked about his current use of herbal medicine replied, "no, not anymore. Now they don't work. They don't suit anymore. Now because of English medicine the herbs are not working." This view is most likely being reinforced over time as participants hear about new and big illnesses, and possibly experience some, and must resort to modern medicine for their management and cure.

India has a decentralized healthcare system that functions on a referral basis. This means that participants often have to travel long distances to larger cities to keep appointments with specialists. This makes modern healthcare very expensive for participants as none of them have health insurance. In their villages they have easier access to the other three types of inexpensive healthcare, but these may not address the big and new health concerns. As a result, the role of modern medicine in the lives of the participants is a complex one.

Healthcare decision-making.

At the root of all healthcare decisions made by the participants was the crucial matter of belief. Participants and health care providers alike were of the opinion that if an individual

believes in a certain treatment or a certain type of medicine, then it is bound to cure them. However, if they doubt the provider, the process, or the medical system, they will fail to benefit in any way. According to one participant,

> Our elders would bring herbs; they would take them and be fine. When people believe, they get cured. I can go to the hospital and they'll give me medicine and I'll be fine. But if I don't believe in it, then how will I get better? If the medicine does not look right to someone and they wonder if it will work, they how will they get cured? If they believe that it will work, they will be cured.

The role of belief was sometimes more important than the treatment process itself because it was assumed that belief would automatically make the treatment work. As one participant shared, "it is like this - when someone believes, then they receive the benefit of it. It is about belief. Say you take medicine, and it doesn't work, pray to God and you will be cured." This participant also emphasized the power of belief in the type of the healthcare that people seek. They did not differentiate between the types of medicine. People generally applied the same principle to all four forms of healthcare available and easily switched from one to another depending on their needs and beliefs.

The participants' views were corroborated by a *lama* who stated that, "so, we the *lamas*, the *gurus*, are like doctors - if people believe. If they don't believe, then we are not. People believe in us, no? They believe in us and come to us. Then we do *puja-paath* [rituals] and it cures the problem." The healthcare providers, especially the folk medicine practitioners, are aware of the mental strength that people derive from surrendering to a higher power. They also value the faith that people bestow upon them when they ask to be cured through folk means or when people ask which form of treatment would be appropriate to pursue for their particular health needs. The moral, religious, social, and/or medical support offered by all four types of healthcare systems determines the healthcare choices and decisions of the village residents.

Not all participants subscribed to this view even though they acknowledged and recognized the role of belief in health decisions and outcomes. One participant said,

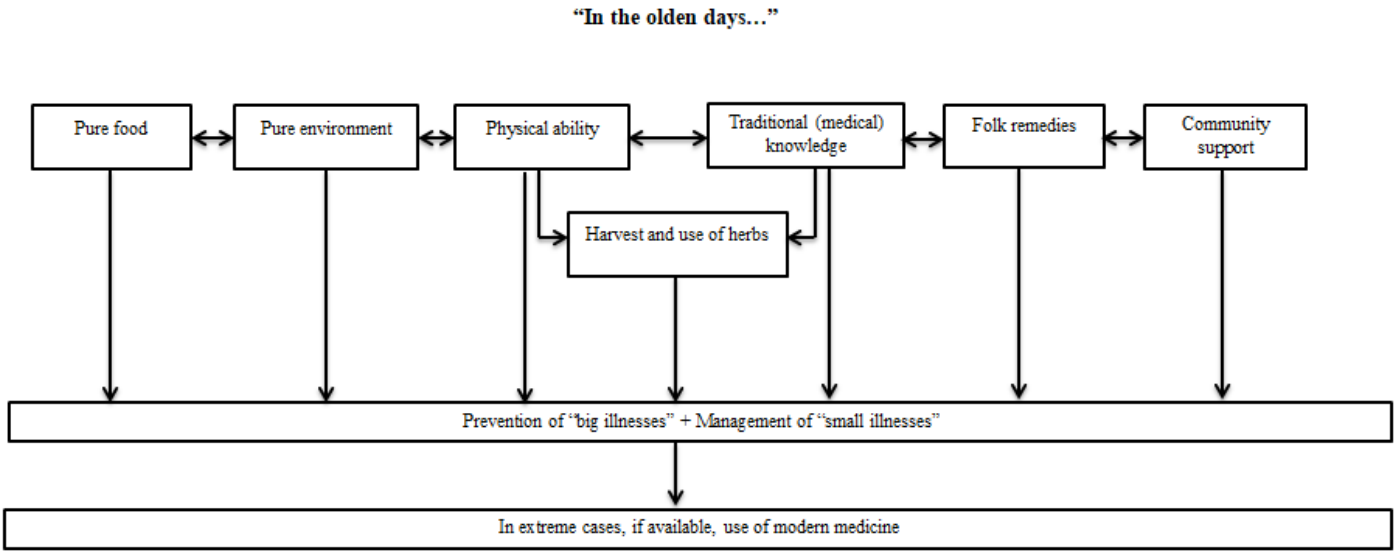
> Now, curing is a difficult job. But people believe that it gets cured so…it is a matter of belief, no? But I don't believe that they [folk systems] will cure. Now if I have cancer, the *devi-devta* [god-goddess] cannot cure me. I will have to get it treated. That is how I will be cured…Because it [folk medicine] is not authentic…[it is not as though] "the

medicine that I am giving you is the only medicine." Now there are some herbs and medicinal plant types that they say will cure…half the illness gets cured if people just believe...if someone believes that "I am eating this and it will cure me" then they actually get cured, no? In the village we have seen that many people get cured.

This participant questioned the method of treatment but agreed that it works for people in his village. This tussle between rational thinking and absolute faith was reflective of the views of not just some participants of this study, but also the younger generations in the village who have not been included in this study but with whom the researcher interacted during her stay in the villages. Many people who question or doubt the non-modern healthcare systems are often unable to justify their stance because of the proven results of these systems, especially folk medicine.

4.5 Time Period: "In the Olden Days…"

Figure 1: "In the Olden Days…"



The time period "In the olden days…" refers to the time before modern conveniences entered the lives of the participants. According to the participants, the healthy lifestyles of their past had influenced their current health status to a great extent. They identified six key factors that they believed interacted with one another to influence people's health and dictate their health seeking behaviors. These included: "pure food", "pure environment", "physical ability", "traditional (medical) knowledge", "folk remedies", "and community support".

Pure food.

Pure food is considered to be plain, local, and natural, generally comprising "rice, lentils, vegetables" because "what else is healthy?" Owing to the altitudes and geographical terrains that the participants and their families inhabited, people had access only to a limited variety of foods that they were able to grow themselves. For the few necessities that did not grow in the region, such as rice, they would visit villages at lower altitudes to trade their potatoes, kidney beans, and wild medicinal herbs in exchange for rice, oil, and other essentials. Sometimes they would buy whole spices such as coriander seeds, turmeric root, cumin seeds, and chilies which they would dry and grind at home. Their meals primarily consisted of rice, unleavened finger millet or barley bread, kidney beans, wild greens and vegetables, potatoes, and wild fruits. Those who had cattle would also eat and sell cow/goat/sheep milk, yogurt, *ghee* (clarified butter), and mutton (goat/sheep meat). All participants unanimously attributed good health to the consumption of nutritious food that formed their traditional diets.

One participant shared, "our elders used to be healthy…there are twelve months in a year, and every month some vegetable gets prepared [ripens] in the jungles. So they would bring those, cook them and eat them. That was their medicine. They used to be healthy." According to this participant, the village elders conducted their own research in the jungles to determine what could be eaten at different times of the year to stay healthy and nourished. Most participants agreed that good, nutritious food enables people to perform all types of physical and mental work. In addition, it successfully prevents the occurrence of big illnesses.

Pure food may also be credited with the treatment and cure of small illnesses or illnesses of old age. One participant, upon being asked about healthy life practices said, "I don't do anything…as long as my breathing trouble gets cured, I'm fine. I eat green vegetables and that cures it…I eat lentils and beans. This is what I eat". In addition to the herbs that are traditionally used to alleviate health concerns, nutritious foods such as green vegetables, beans, and lentils are also believed to aid the healing process.

Good health is not just an outcome of the consumption of certain types of foods, it also relies upon the avoidance of other types. As one participant shared, "for good health, one must not smoke *bidi* [indigenous cigarettes made with unprocessed tobacco wrapped in leaves], cigarette, [or] drink alcohol…when someone drinks, their health suffers". The consumption of harmful and addictive substances such as alcohol, *bidi*, cigarettes, and *paan* (betel leaf with areca

nut and tobacco) is discouraged not only due to their ill health effects, but also because it is viewed as morally wrong behavior or "dirty work" that leads people down "the wrong path". Many participants mentioned the lack of availability of these substances in earlier times.

One of the primary reasons behind the participants' sustained access to healthy, nutritious food was organic farming. The lack of modern amenities meant that there was an absence of fertilizers in the region. As a result, fields and crops were nourished by organic manure. As one participant shared, "we [would] use our manure of cow dung. We would bring sheep/goat droppings and add that in our farms…we would grow those crops, our original crops. That is what we ate. We did not add anything to our potatoes or apples…" Participants believed that if people eat foods "provided by nature", and if those foods are grown organically, then people are bound to stay healthy and active. They also agreed that this was easier to achieve in villages as people have very little access to chemical fertilizers. Many participants, especially those who still have domestic animals, continue to use manure in their fields.

Pure food, with its preventive and curative properties, was believed to be one of the strongest health determinants in the region for centuries. The local food production process not only increased the food and healthcare security of the population, but its sustained consumption in the past is likely reaping benefits for the now-older adults who experience negligible incidences of big illnesses and are able to work and live independently in their homes.

Pure environment.

Similar to pure food, pure environment was credited by the participants with having a large impact on the health of the people in the region. The villages are located in the Greater Himalayan region at altitudes of approximately 8,000 feet on the banks of the Bhagirathi river that originates just above the villages from the Gangotri glacier at 13,000 feet. The glacier runoffs are the primary sources of water for the residents of the three villages that are surrounded by high peaks and mountain ranges on all sides. There is one road along the river that manages to connect most villages; all other local travel necessitates extensive walking in very hilly terrain. The temperature in the region ranges from cool in the summer to below freezing in the winter. The mountains are covered with dense forests comprising thousands of species of native flora, including endemic medicinal plants. The participants felt that all of these together created a healthy environment and promoted healthful practices and behaviors while preventing the occurrence of big illnesses among the older population.

According to one participant, “they [big illnesses] are very rare here in the mountains. The water here comes from medicinal herbs [it comes in contact with medicinal plants as it flows downhill]. The water is pure so there are fewer illnesses”. The residents of the villages not only receive water directly from the glaciers, but their water also undergoes natural enrichment as it flows downhill and makes contact with the roots of medicinal herbs. Other participants mentioned that “there is no pollution here. The air is pure and the water is clean”; “there are *deodar* trees, jungles…many people use medicinal plants”; “there are no mosquitoes here”; “the climate is good…people work all day”; and “the mountain air keeps the mind sane”. According to the participants, the combination of various factors including the lack of pollution, clean mountain air, cool temperatures, and the absence of mosquitoes and thereby vector-borne diseases, enabled people to stay healthy and perform work that is integral to their daily lives.

Although all these factors limit the occurrence of big illnesses, most participants mentioned at least one common illness that they attribute to the climatic conditions of the region. As one participant shared, “there is little air circulating here so people have more trouble breathing. There is less oxygen here so people go down [to lower altitudes].” *Dammi* or breathing difficulty due to rarified air is the most common illness of old age affecting the participants of the villages. Those who experience severe symptoms sometimes decide to settle down permanently in their winter residence at lower altitudes.

The pure environment of the region, with cool temperatures, clean water, and pollution-free air, combined with the healthful properties of medicinal plants, *deodar* trees, and other native plant species, greatly influences the health status of the local population. These benefits have been enjoyed by the older population for decades, and will likely continue to serve as preventive measures against big and new illnesses that seem to be bypassing the older population to this day.

Physical ability.

The geographical location of the region not only provided favorable atmospheric conditions for good health, but also influenced the lifestyle of the population. The older population has always had to rely on hard physical labor to survive in the region. The current generation of older adults worked with their parents to establish homes, farms, and livelihood opportunities in harsh terrains when roads were non-existent and transportation of goods depended on mules and able human bodies. Moreover, most people’s traditional occupations

involved cattle rearing, farming, and medicinal plant gathering that necessitated long hours of physical work and treks up the mountains. Women shouldered additional duties of visiting jungles to collect firewood, fodder, wild vegetables, and manure; they also walked down to the river to fetch water for the family and cattle, in addition to performing household chores and working in the fields. Consequently, almost no participant reported experiencing new and big illnesses that are associated with sedentary lifestyles and obesity in current times.

One participant provided the example of his friend who lived in the village where the interview was being conducted:

> My friend has gone 3 kilometers up [to another village]…he went in the morning, came back in the afternoon. He had a meal and then went back up. Then again in the evening he will come back. He will make 2 rounds, so 6 kilometers [each time]…so if he runs approximately 10-12 kilometers then he will obviously be physically fit.

This is an example of the daily routine that many men followed in the past, and some, if they are still able, continue to follow even now. According to the participants, the benefits of such active lifestyles are manifold and have long-lasting effects on the overall health and longevity of individuals.

Health status among participants was often measured by their ability to perform work rather than being diagnosed with illness. The ability to work in turn was directly related to the consumption of pure, nutritious food that provided the strength to perform work. Consequently, "people in earlier times were strong". Most participants also considered being busy a cause of good health. According to one participant, "since we stay mostly busy, we stay healthy. Too much leisure is not good. It becomes a difficulty." Most participants reported not having much time to be idle and spend in leisure as there was always work to be done. Women shared that, "my work all day long is in the soil" and "we run around a lot, we work from morning to evening, we go to the jungle, bring wood, bring grass…[this keeps us healthy]." In the villages, physical work was not only a guaranteed way to stay strong and healthy, but the ability to perform daily tasks was an important indicator and measure of self-reported health.

Traditional knowledge.

Most participants grew up using herbal remedies to treat and cure small illnesses. Consequently, knowledge about these had been passed on from one generation to the next. Herbal remedies included not only medicinal plants but also ingredients used in daily cooking,

such as whole spices. These home remedies are still prevalent in the region today; they form a large part of the collective traditional (medical) knowledge of the community. According to one participant,

> My mother told me that I should eat this [herbs and spices]. Now, there are many types of spices in India, but it is not written in any book that…well, it may be written, but people usually store it as knowledge. So my mother must have been told by her mother or her mother-in-law that eating this [herb/spice] may lead to this [cure]. Eating turmeric has these benefits, and eating other spices will lead to this [cure]… somebody must have passed on this traditional knowledge, so we are also doing the same. It can only benefit.

Traditional medical knowledge was indispensable among this population that had no other source of information and whose survival depended on accurate transfer and use of this knowledge. Today, part of this knowledge has been absorbed in local culinary traditions; other components that are not easily adaptable are gradually being lost.

Although traditional medical knowledge and practices continue to be used as the first line of defense in the case of an illness even today, traditional non-medical knowledge has been equally important to the community that had to grow and thrive in relatively inhospitable conditions. This knowledge helped people to build homes out of local resources; log the wood of specific species of trees at specific times/intervals; source water from streams; harness hydro, solar, and wind energy; build walking paths; branch out into various occupations; make their own clothing; test food crops to identify those which would grow in the region; identify and harvest edible plants and medicinal herbs from snow covered forest beds at dangerously high altitudes; and protect themselves from natural and supernatural elements, among other socio-cultural-religious traditions. All of these together formed a large bank of indigenous knowledge that, in the past, helped people to care for their families, animals, homes, and farms.

Harvest and use of herbs.

The combination of physical ability and traditional knowledge allowed the participants to successfully research, identify, harvest, and use medicinal herbs for various small illnesses. As one woman shared, “in the bygone days we would live in the jungle, see things, ask each other and learn about herbs.” Earlier, most commonly used herbs were available in jungles around the periphery of the villages. The more potent herbs grew in the highest reaches of the mountains. Participants usually spent two days walking up the snow-covered mountains, spent a night there,

gathered herbs the following day, and descended later that day or the following day. It was an arduous task, sometimes dangerous, but was undertaken by most residents of the villages, men and women alike. As mentioned above, two major components were required for the journey to be successful - physical ability and traditional knowledge - without which the herbal medical system of the region would be severely limited in scope.

Folk medicine.

For illnesses that herbs alone could not cure, there was folk medicine that was used either independently or in conjunction with herbal medicine. The folk system was used as a guiding force to direct the course of treatment, particularly for illnesses caused by supernatural elements. For example, one participant shared the concept of *upri chhaya* or "shadow from above":

> Say somebody goes to the jungle, and there is some sound, or someone [the person visiting the jungle] is scared, we say that a shadow has fallen on this person. We call her *matri*, like a spirit…They [villagers] used to go to jungles, so she [the spirit] used to be spotted frequently…for example, if I see that you are walking that way but you're actually not there…say there are 5 people going somewhere and one of them sees that somebody - a lady - is walking, and the other 4 don't see anything…this means that there is something [the shadow] that has fallen on that man.

In instances such as these, the villagers ask the village *devi-devta* (conduits of god/goddeses) or the *doli* (palanquin) for guidance to handle the after-effects of the encounter that are usually manifested through health concerns in the individual. In most cases, the spirit needs to be pacified with offerings of *roti* (whole wheat flatbread) and/or *puri* (unleavened deep fried bread) along with 8-10 sides such as chilies, salt, coconut, chickpeas, amaranth, sweetmeats, sugar and *ghee* (clarified butter). Sometimes, in extreme cases, people may have to offer a goat/sheep, although this trend has reduced drastically. Now, people mostly offer food items.

Sometimes, people may not experience immediate after-effects, especially when they are unaware of the shadow having passed over them. In such cases, the spirit may remain unpacified for a long period of time, sometimes years. This may only be brought to the attention of the individual by the village *devi-devta* (conduits of god/goddesses) or the *doli* (palanquin) when an illness remains uncured through normal means. The conduits or the palanquin can help identify exactly when and where an encounter took place. For example,

> Say that I've forgotten that I once saw something…I start feeling sick, medicines don't have an effect, then if you ask them [conduits or palanquin], they will tell you that "you went in that direction"…or they will say that "there was a sound of a stone ahead of you", or "you heard somebody's voice shouting and [thought] 'is someone calling out?'" However you may have seen it, that is exactly how the *devta* [conduit] will describe it. So, then, you have to recall. If somebody doesn't remember, then it [conduit/palanquin] will remind them that 'you were in that direction for this much time…you heard the rustling of leaves…so, this is what must have happened'….but this has reduced a lot now. There aren't so many cases now, but earlier it used to happen a lot, and people were also very scared. Earlier everything depended on them – *jadi-booti* [herbs] and *devtas* [conduits]. Now these things have reduced a lot but they are still there.

Although these specific encounters with the *upri chhaya* have reduced in number, a fair share of illnesses and ill fortune continue to be attributed to spirits believed to be lurking around in the region, especially the spirits of people who have died in road accidents in more recent times. The process of treatment of such illnesses also continues to remain the same – through the intervention of *devi-devtas* (conduits), the village *doli* (palanquin), and *ginti* (counting) ceremonies. In earlier times, if herbs did not cure illnesses, the folk system was the automatic route that people selected due to the predominant belief that whatever could not be cured by herbs could be cured through religio-magical means.

Community support.

Rural communities are inherently interdependent in nature; people rely on one another in times of need to provide support, good advice, food, and monetary assistance. The herbal healthcare system in the region was also dependent on collective and collaborative efforts among village residents. As one participant shared,

> In our time, nobody would sell them [herbs]. For example, in the village, 5-7 people would bring some [herbs] and distribute it among everybody in the village. Say I get fever, somebody might say that "oh, so and so had gone to collect herbs, bring some from them". So, people would give. It was all free. There was no question of using money in those days. Neither did I give anyone [money], nor did anyone give me. So it was in asking and sharing that we would manage with love and good relations with one another.

According to the participants, people in earlier times were invested in each other's well-being as they collectively shouldered the responsibilities of illnesses. From harvesting herbs to administering medicine, people contributed in whatever way they could.

Expectedly, human resource was a very valuable asset in the community, especially in the absence of external facilities such as transportation and communication. As one participant shared,

> Earlier, for water we would go to the stream in the morning. So, all daughters and daughters-in-law would go to the water in the morning, they would share their happy and sad stories – somebody had a fight, somebody fell sick, somebody's cow didn't come home – we would get to know everything…we would all get together for someone who was sick in someone's house. Everybody would remember to do things for them, they would share advice about medicine.

It is interesting to note that women were the primary news bearers in earlier times. Not only did they listen to each other and help one another, but they also enlisted the assistance of other members of their family when required. The participant continued,

> Earlier, if my cow didn't come home, all the women and the children at home, everybody would go to look because the cow didn't come home. Or if somebody's [family member carrying] grass/wood didn't come, if somebody fell in the jungle and didn't come, the whole village would carry *chirag* [torch] to go and look where she went, in which direction…they would ask friends what had happened, where it had happened; everybody would go. If somebody fell sick, we would get together by the water. People would graze their cows and talk about it there. Everybody would want to help.

The participants highlighted the role of community support in dealing with illnesses and losses in earlier times. They stressed that people cared about each other and willingly extended cooperation and assistance in times of need. As another participant said, "earlier, everybody worked to ensure others' welfare"; they "kept their word" and took care "not to harm anybody's well-being". This interdependent nature of relationships among relatives, neighbors, and friends, created a close-knit community that weathered storms together.

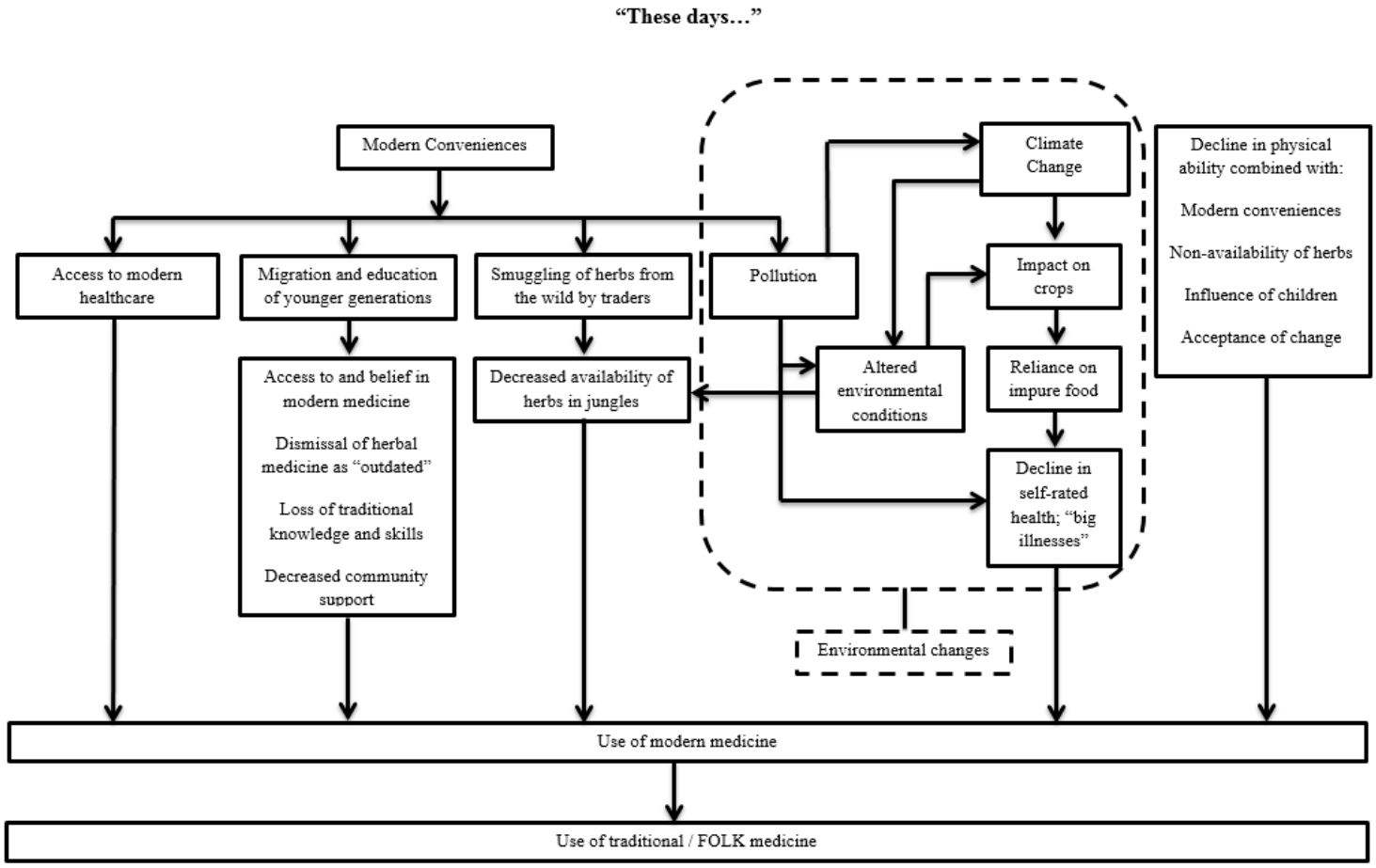
Health seeking behavior.

In the olden days, the combination of pure food, pure environment, physical ability, traditional (medical) knowledge, folk remedies, and community support acted as preventive

measures against big illnesses, and curative and supportive measures against small illnesses. These components allowed people to live healthfully, develop and hone their traditional knowledge and skills, build cohesive communities, and create unique socio-cultural-religious norms that kept people tied to their culture and communities. A significant part of these customs surrounded health seeking behaviors as people relied on herbal and folk medicine. In extreme cases, if these remedies did not work, people would make long journeys into cities to seek modern healthcare as their last resort.

4.6 Time Period: "These days…"

Figure 2: "These Days…"



The time period "These days…" refers to recent times, specifically the last two decades, in which participants have witnessed significant changes in the nature, cause, and treatment of illnesses. This is the time during which participants have become familiar with big and new

illnesses that have arisen from a multitude of interrelated factors affecting their immediate environment, lifestyles, and socio-cultural norms. This section will explain these factors and their effects on the lives of the participant as they experience them.

Modern Conveniences.

The category "modern conveniences" encompasses modern technologies, amenities, and government programs that, according to the participants, have impacted four primary domains of their lives: access to modern healthcare, migration and education of younger generations, smuggling of herbs from the wild by traders, and pollution. These in turn have influenced and shaped the healthcare usage patterns and health behaviors of participants and their families. In the section following this brief introduction, the first three domains will be discussed independently; the fourth domain, "pollution", will be discussed together with climate change and its impacts in the following section titled "environmental changes".

Access to modern healthcare.

Access to modern healthcare describes the availability of modern or English medicine and modern healthcare facilities. Ever since India gained independence from Britain in 1947, successive governments have actively tried to expand healthcare, education, transportation, communication, sanitation and other similar facilities in rural areas around the country. Although progress has been fairly slow and resources unequally distributed, the villages included in this study currently have access to several government-funded healthcare facilities and private pay options depending on their ability to pay for them.

Village 1 is home to a first-aid dispensary which has two beds and serves the residents of eight villages. People with illnesses that cannot be treated with the basic facilities available at the dispensary are referred to the Primary Health Center (PHC) in a town 45 kilometers downhill. PHCs are single physician clinics with provisions for minor surgeries. Cases from there may be referred to the district-level hospital at the district headquarters a further 30 kilometers downhill. If they too cannot help, patients may be referred to the state hospital in the state capital 145 kilometers away. In addition, people have access to private practitioners, clinics, and hospitals in other parts of the district and/or state if they can afford the fees. In extreme cases, they may travel to metropolitan cities where they may access government-funded healthcare or pay out of pocket for treatment at private facilities.

According to the pharmacist at the village dispensary,

> This is a small dispensary. We provide first aid type of care. If there is something more [serious] then there is 108 [ambulance] here so we refer them…if people have loose motions etc. we admit them here [in the dispensary]. Or if there is something serious, or people come in the evening but there are no arrangements [transportation] to move them [to other facilities], we keep them here.

He estimates that the dispensary sees a footfall of 70-80 people per month for issues such as:

> Fever, loose motions, body ache, cold, and cough…for big things people go down [to district/state hospitals or private clinics]…they go on their own [instead of being referred]. Now there is the convenience of transportation. They also know that there aren't too many facilities for examination here so they go themselves. People have dental difficulties as well, tooth ache, etc.…we give [medicine] for the pain. But if the tooth has decayed then there is no provision for extraction here. So they go down".

It is common, and often necessary, for residents of the villages to travel to towns at lower altitudes to access the services of larger, better-equipped healthcare facilities.

According to the pharmacist, few older adults visit the dispensary as they generally do not fall sick. Among those who do, hypertension is a common ailment. Those who have more serious health issues, especially with mobility, prefer to live at lower altitudes with their children. In addition to the dispensary, there is one small private clinic in the same village. Additionally, participants may use the healthcare facilities of the armed forces. The latter, although considered excellent by the participants, does not guarantee continued access as permission for civilian use may vary depending on the commanding officer and/or security-related circumstances.

The decentralized healthcare system of India provides a modicum of healthcare choices to the residents of the villages. The daytime availability of transportation facilities to and from village 1 further enhances this choice. In addition, many participants have access to radio, and some to television, where the government runs advertisements and health campaigns to encourage immunization, promote use of health services, encourage healthy practices as a means to prevent illnesses such as malaria and dengue fever, discourage the use of alcohol and tobacco, and educate people about symptoms of modern (new and big) illnesses so that people use healthcare resources in a timely manner. Moreover, people have access to mobile phones, and

therefore, increased opportunity for communication, which greatly influences healthcare decision-making. As one participant shared,

> If we take medicines here and it doesn't cure us, then the doctor tells us to go to [city] because there are big doctors there. So people go there. Now people have money, they have information, they are educated. Earlier, people did not know much.

All of these new amenities, along with greater disposable income among the younger generations, encourage people to use modern medicine.

Migration and education of younger generations.

The same modern conveniences, such as transportation and communication, that influence health-related practices and decisions, also enable educational and professional aspirations among younger generations. For most families, the quest for education and jobs is synonymous with migration from villages to cities where opportunities exist. Migration, however, entails not just family members living apart from one another, but also significant changes in lifestyles and the loss of traditional norms, belief systems, and social support that are integral to life in the villages. Over time, migration has enhanced young people's exposure to well-developed modern healthcare facilities and, as a result, has altered the way they think about healthcare. The effect of this changed outlook is now felt by the older family members in the villages whose belief systems are often dismissed by the younger generation as being "outdated", "backward" or "uneducated".

According to one participant, "we old people use them [herbs] sometimes, but the younger ones think we talk rubbish. Now they have moved towards English medicine. Now there are hospitals everywhere". This participant shared how the younger generation is gradually gravitating towards modern healthcare of which there is abundant supply in cities compared to villages. Another participant said,

> Well, everybody says that this [herbal medicine] is old-fashioned, that these are modern times. They say that "you don't go to doctors, you are *ganwar* [backward] people"…that is why everybody has forgotten these things. But some older adults remember that it [herbal medicine] works. It always works. It is something with a lot of credibility.

This participant, like some others, expressed frustration that the use of non-modern medicine implies backwardness, and therefore, holds little value in the lives of younger generations.

Another participant seemed resigned to the fact that the older generation's knowledge or advice has little relevance in modern times:

> We tell them [the younger generation] to [use herbs]. Now if they listen, then good. If they want to go to hospitals, it is their wish. These days children are smarter than us in everything. Now if we try to teach them…they might think "what will he teach us? He is uneducated. He's a fool. What does he know? We are educated." Isn't that what they'll say?

This participant echoed the views of other participants who also mentioned that younger generations are dismissive of the herbal healthcare system and traditional medical knowledge.

On the other hand, there were participants, especially those who had never received formal education, who agreed that the older generation indeed did not know much because they were uneducated. According to one such participant,

> Our children's generation is educated, they know better. We were uneducated, we didn't know much. Uneducated people don't have much *buddhi* [intelligence]. Educated people have more *buddhi*. This generation of children has a lot of *buddhi*, people of earlier generations did not have as much *buddhi*.

This participant believed that formal education alone breeds intelligence and knowledge. She usually defers to the views and knowledge of her city-dwelling children when making healthcare decisions.

Modern conveniences and the resulting migration of younger generations seem to have alienated the younger and older generations from one another with respect to their health beliefs and healthcare practices. It is important to note, however, that a handful of the participants mentioned never having used herbs or having used them only sparingly. Most of these participants had occupations that did not require them to visit areas at high altitudes where herbs were found. As a result, they either depended on health awareness camps and temporary clinics that were sometimes organized by the state government in the past, or travelled to healthcare facilities at lower altitudes. These participants also happened to be in the 55-65 age group and probably had at least some access to modern medicine compared to the older participants. None of the participants in this study had ever cultivated herbs. One participant had tried, but the plants did not survive the three year gestation and growth period. The state government currently has a nursery where it is trying to cultivate some vulnerable and endangered species, but the results are

not very encouraging as it is hard to mimic alpine temperatures, soil complexity, and the natural forest ecosystem. As a result, the herbal medical system is gradually losing its relevance.

In addition to the loss of traditional belief systems, some participants also rued the loss of traditional knowledge in the community. The older generation is aware that they are the last custodians of certain traditional skills and knowledge that will be lost if they are not transferred to the next generation because they are passed down orally and experientially rather than through written words. According to one participant,

> They [younger generation] don't believe in all this [herbal medicine]. It must be the times or people's mentality that has changed. For these [herbs] we have to go to jungles. Now nobody is ready to go to the jungles. We have seen jungles, but only a few of our children have seen them. They don't know anything about plants. Most of the new generation, they are not ready to go the jungles. Then how will they gain knowledge? But yes, if you talk about towns and cities where motor vehicles go, everybody is ready to go there, but nobody is ready to walk. This is the problem. You have to go there on foot. You may not find water so you have to control your thirst. There are no arrangements for food so you need to control your hunger. You obviously get tired and sweat…if it is cold you have to bear it. Nobody is ready to bear these pains, they don't even have the *kshamta* [capability/capacity]. We people from old times, we would eat in the morning and then get food only in the evening. We would control ourselves. But people these days do not want to control.

This participant identified several factors including differing belief systems and the lack of capacity to bear physical strain that deters the younger generation from venturing into the mountains in search of herbs.

There is, however, another aspect that keeps the younger generation from following in their elders' footsteps – the lack of interest in working so hard for a result that can be achieved much more easily. According to one participant,

> Neither do they [younger generation] believe in medicinal herbs, nor do they have the capability to go to the *bugyals* [alpine pastures and meadows]. They cannot climb up; we can do it but they will not. They say "we will go to the jungle for 1-2 roots, why not spend a few rupees and just buy medicine? That will also provide immediate relief."

> [They don't understand that] with herbs you will live but the illness will get killed. You won't get another illness.

The modern medical system is often perceived as a win-win situation among the younger generation as medicines are easily available and relief is immediate when compared to herbs that take time to cure illnesses. However, according to older adults, the younger generation does not take into consideration the various side-effects of modern medicine and its success in only treating symptoms rather than bodily systems. Many were of the opinion that "medicines from the government hospitals cure immediately and then it [health and illness] goes back to square one" and other illnesses emerge.

Participants offered mixed reactions when asked about their emotional response to the loss of traditional knowledge and skills. Some categorically mentioned being disappointed: one participant said, "these are our customs, our things - our original things; of course we feel bad. When I think about the jungles and mountains that I have been to before, I wish I wasn't old, I wish I had as much strength as before, then I would go again". This participant held traditional knowledge, skills, and customs in high regard and expressed disappointment at the way things were changing. Another participant echoed these thoughts, "of course it makes me sad that they [younger generation] don't listen to the things that we say. So it does feel bad, a little." This participant also seemed a little disturbed at the distance that was being created between the three living generations due to changing times.

Other participants seemed more accepting and understanding of the new changes. According to one participant, "why feel bad? Study, work, that's it. Make your own life. Isn't it?" This participant seemed to have reconciled his feelings with changing times. He added,

> Well, times have changed. The atmosphere has changed. People have changed. In earlier times, if a person had education, even if they were poor, they would be respected because they were educated. People would respect and honor them. Now it is people with money who have respect. It doesn't matter how they earn the money, they are respected…this is how it is now, times have changed. What to do? The world will carry on.

This participant used this rationale to accept the fact that younger generations must receive education and hold jobs in order to earn money, and therefore, respect in modern society. As a result, migration is inevitable; so is the loss of older socio-cultural norms and traditional lifestyles.

The final impact of migration mentioned by the participants was the declining levels of community support due to smaller numbers of family members living together. It is important to note that at the time of the study, all primary participants were residing in their summer residences which meant that they were all able to function independently. As one participant said, "[our] children are all over the place. Right now we are able to earn, cook, look after our fields and orchards. We can do it that is why we come here". It is the norm for physically able older adults to spend half the year in their summer residences. Even so, they did mention that many houses only had older couples living in them rather than the traditional three-generation norm, and that this could sometimes lead to loneliness. According to one participant,

> The problem is that the villages have only old people, and daughters and daughters-in-law are gone. Their children turn three, and they put them in school there [in cities] itself. We don't have English-medium higher education here. The ones who had to work, they left. What can we do? We now guard our houses and eat. This is all we can do. What else can we do? This tradition of migration is a very bad thing.

This participant, like almost all others, spends half the year away from the younger members of her family. Although this half-yearly relocation is voluntary, all participants mentioned feeling physically and mentally better in the cooler temperatures of the mountains. As a result, as soon as the winter season ends, older adults move to their summer residences. The rest of the family joins them temporarily for festivals before going back to their jobs and schools in the cities. This is different from earlier times when families would relocate together twice a year. This temporary separation of families not only affects domestic life, but also prevents people from providing support in times of need like they were able to do in earlier times.

The new trend of migration for educational and professional opportunities, aided by the availability of modern conveniences, is irrevocably changing traditional lifestyles and socio-cultural norms including healthcare practices that are being influenced by younger generations. Consequently, many older adults are now seeking out modern medicine, especially if they are affected by new or big illnesses. Most, however, do not use these unless absolutely necessary.

Smuggling of herbs from the wild by traders.

Modern conveniences, in addition to enhancing access to modern healthcare and enabling migration, have also significantly boosted the domestic and international trade of medicinal herbs, especially those that are endemic to the Himalayan region. Several such species are

currently vulnerable, endangered or critically endangered due to overharvesting and unsustainable harvesting practices. Although the government has made major strides in protecting habitats and regulating trade, smuggling activities continue along the vast inter-state and international borders at altitudes where patrolling is difficult, and therefore, poorly executed.

The biggest challenge by far is the practice of unseasonal and unsustainable harvesting. The species that are most in demand are also those that have a gestation period of approximately three years. This time period allows a complete cycle - from the germination of ripe seeds to the natural shedding of ripe seeds three years later from the mature plant - which then enables natural regeneration of the species. Smugglers, however, harvest the plants a few months before the seeds can ripen and shed from the mature plant. As a result, when they harvest plants, they take the roots as well as the new seeds leaving nothing behind to regenerate. According to one participant,

> Everything takes three years. We have to wait for one year. For example, if we plant the seed this year in March-April, and if we dig now [in September] we will find very small roots, there will be no seeds. So, this year we will let it be. Then next year the roots will strengthen and become bigger. Then in the third year it will give seeds…they [smugglers] uproot the plants. They harvest them as soon as the flowers start growing so seeds aren't even made yet. One or two may be left behind, and that helps with regeneration in the following year. Earlier it used to be that the seeds of every plant would be left behind, they would accumulate there, so there were a lot of plants, [now] they have reduced a lot, medicinal plants have reduced a lot.

Medicinal plant trade is an extremely lucrative business, and smugglers harvest fairly large quantities. Consequently, every year, large sections of forests permanently lose their capacity to regenerate and replenish the natural stock of medicinal plants.

Most smugglers prefer to uproot plants in the months of August-September just before winters set in so that they do not have to look for plants under snow cover. According to one participant,

> They [smugglers] dig in August. But digging in August destroys the seeds. If they dig in November-December, then there are seeds left behind for regeneration, and also medicines for us. Earlier villagers would bring for themselves. They would say "don't go to the jungle, the seeds haven't ripened yet." But those who are doing business, what do

> they care about seeds? They are only interested in destroying. So they dig them up in August.

Harvesting plants a few months before the first snowfall helps increase profit margins for businesses as it significantly reduces the labor and time required to find medicinal plants in the forests. This practice differs greatly from the way participants used medicinal plants in the past - "earlier people would go and do their farm work. There was no business. They would bring medicinal plants for themselves, so 10-12 people would go one day, 10-12 would go another day, they wouldn't get too much – maximum 1 kilo, and that was enough for the whole year." Not only did people harvest medicinal plants at the right times in the past, but they also took very small quantities compared to the thousands of metric tons that are harvested for trade now.

Currently, the forest department regulates the harvest and trade of medicinal plants. Every year, one section of the forest is selected for harvest - the forest department hands out contracts and licenses to traders to harvest specific species in the specified area only. After the harvest season, the area is closed off for 5-10 years and another area is designated for the following year's harvest. In this way, every section of the forest is given the time to regenerate while trade of medicinal plants in also not adversely affected. Although this is the process being followed, smuggling continues among those who are unable to get licenses or those who want to harvest relatively smaller quantities for quick money. According to one participant:

> It is hard to catch them [smugglers]. Who knows which jungle they have entered? It is a loss for those who live here permanently - the local people, not those who steal, who do business. Nobody catches them, who will check to see in which bag or bedding they have stuffed them? There are many measures by the government but the thieves get away, they don't get caught. They'll get away from another route. If that is being checked, they'll take a third route. If they think that this jungle is being watched, they'll get out through another jungle. They get away; no one knows where they are. When villagers take their sheep/goats, they see that this place has been dug, this place has also been dug, so has this other place…That is when we get to know that these people have destroyed…

Despite regulations, the smuggling business has continued in the region and there remains little hope of catching every single person who violates the law. Additionally, corruption is also

prevalent - “every vehicle is checked during the herb harvesting season, but people bribe officials and take the herbs. If someone is carrying herbs worth 10-20 lakhs [1-2 million Indian rupees], he can bribe the official with 50-60 thousand rupees and get away with it.” Corruption adds another dimension to factors threatening medicinal plant survival in the region.

Sometimes, villagers themselves harvest and sell herbs illegally. However, as permanent residents of the area they have to be very careful. All vehicles are inspected at designated checkpoints along the main road during harvest season including those that the villagers hire to transport them from their summer to winter residences. If the forest department catches somebody selling herbs, they face consequences -“if we get caught, we’ll get beaten up, humiliated, we’ll go to jail.” Even then, poverty drives some people to take risks.

Although the rules and regulations were put in place to protect plants and their habitats, they have also inadvertently impacted the traditional healthcare systems of the local population. The law prevents all persons from harvesting medicinal plants which includes the villagers who are legitimate users. Currently, villagers are allowed to keep very small quantities for their personal use – 200 grams of each species – a privilege that they gained only after a long fight. According to one participant,

> If we have it [medicinal plants] at home or if we have 100-200 grams [on us] then the forest department cannot say anything. Earlier when people got caught [arrested], our leader went to [district headquarters] and held a hunger strike – “we are jungle dwellers and have been using medicinal herbs for generations. How can you catch us?” Then, after doing this repeatedly, we can now keep 200 grams of herbs.

The difficulty in procuring, legally storing, and transporting herbs in current times has led to a decline in medicinal plant usage, and thereby the herbal medical system. Consequently, people are increasingly turning towards the modern healthcare system.

Environmental changes.

Pollution.

Government-led developmental efforts have inevitably led to increased air, water, and noise pollution in the region. The availability of modern conveniences has significantly increased tourism activities including pilgrimages and treks from April to November every year. This increased footfall has in turn strained natural resources, encouraged illegal and unsafe construction of buildings, and significantly increased traffic on the sole arterial road in the

region. It has also warmed temperatures and introduced mosquitoes and pests to the region, in addition to contributing to climate change and its related impacts such as glacier retreat and natural disasters. According to one participant,

> Earlier, you see that peak? It would be covered with snow even now [August-September]. Now it is not so; because of too much heat. And look at Gomukh [glacier], it has receded three kilometers. Earlier it [glacier terminus] was lower…now it has gone ahead [retreated]….it has become so hot and pollution has increased. Earlier there were very few people - from army to tourists - there were very few people. Now it is full of army personnel and others, so there's more pollution.

Pollution and heat have been a direct result of increased human presence and vehicle usage in the region. Another participant shared,

> We never had mosquitoes here; we had flies, but never mosquitoes. But now we have mosquitoes; there's more pollution, no? I saw 2-3 mosquitoes in my house this year…this is the first time. I had never seen mosquitoes except at [lower altitudes]. We had none at all here….now insects come into our beds…people are walking, workers are walking, tourists are walking…"

Although the villagers have still not been affected by illnesses such as dengue, they have seen cases of malaria and are bracing for other such related illnesses in the near future.

The increased strain on local resources and environment also resulted in one of the region's worst natural disasters in 2013 when a multi-day cloudburst caused massive floods and landslides killing people and causing extensive damage to homes and infrastructure. Being the peak tourism season, over 110,000 people had to be evacuated from the area. At the time of this study, river embankments were still being extended and bridges still being repaired/reconstructed. In the villages, former apple orchards are now lying barren as they have been rendered non-arable from the large amounts silt and boulders that were washed down with the flood waters.

Increased levels and types of pollution have not only altered local environmental conditions and contributed to larger climate change impacts, but have also affected the health of the people. All participants mentioned experiencing better health in the mountains due to cooler temperatures and fresh air. Of late however, they have been experiencing warmer temperatures that impact their well-being and lead them to the use of modern medicine to alleviate discomfort.

Climate change.

Climate change is manifested in various ways; it is also exacerbated by various factors. Primary among these factors is the contribution of pollution from human activity and impact, as described above. Among the many manifestations, the participants identified warmer temperatures, unseasonal/erratic rainfall, and reduced snowfall, all of which affected their crops, which in turn determined their health status and healthcare practices.

Impact on crops.

The local climatic conditions support the cultivation of only a limited variety of crops such as potatoes, kidney beans, and apples. Of the crops that grow in the villages, apples are cultivated for commercial purposes. Other crops are cultivated in smaller quantities for personal consumption and to share with friends and relatives in the villages downhill where participants have their winter residences. The few crops that grow in the villages are part of the people's core diet which is supplemented from time to time with fruits, vegetables, and spices from the market. Consequently, when environmental changes affect the cultivation of these crops, people's food security is threatened as, according to participants, homegrown food is cheaper and more nutritious and pure due to the use of organic manure. According to one participant,

> Earlier the whole house would be buried, and 4-5 feet of snow would collect on the ground. When we would come back [from winter residence] the whole house would be buried under the snow. Then we had to break it and enter the house…when it snows, the crops grow well. If there is no snow, there will be no crop. There is less softness…for example, when it snows, it stays frozen on the ground. If it stays frozen it will melt gradually [into the soil]. When we add water to the soil [irrigate] then it [soil] will drink [absorb] a little bit, and the rest of water will flow away. But the snow will stay frozen. That helps the crops to grow well. Because the soil is soft; the water keeps melting into the soil.

This participant echoes the views of many participants who stressed that 4-6 feet of snow cover on the ground is necessary to cultivate good apples because not only does the soil stay cool under the snow, but the moisture constantly seeping into the ground helps the apples to grow well. In recent times, however,

> It does not snow like before anymore. Earlier, in October, after *Dussera* [festival] it would start to get cold, but now it is warm. In December, January too, the weather stays

like this. I came last year in February; there was no snow, nothing, all the mountains were naked. So, there has been a lot of change in the atmosphere.

The region in the last couple of decades has been experiencing warmer temperatures than before. As a result, apple growers have now resorted to the use of chemical fertilizers and pesticides to grow big apples that generally fetch better prices in the market.

Another participant shared the experience of untimely rains last year when the study was being conducted,

> It should rain…the three months of monsoons, no? It should start from the beginning, from June-July. This time it didn't happen…this time the rain came in August. That is why all our crops got destroyed…whoever planted whatever... too much water filled up, the crops could not flower.

Just as lower levels of snowfall affect apples, unseasonal rains affect the food crops because when the rains don't come on time, "everything gets disturbed". Additionally, the lack of timely and adequate rain means that "there isn't enough grass on the ground. We rear sheep…if there is less grass then our animals will be weak. It is a loss for us…when there is no yield, it is a loss." The food and income security of the participants depend on their traditional occupations of farming and animal husbandry, which in turn are reliant on timely seasonal cycles. In recent times, however, their occupations and income security are both threatened because, "when it is supposed to rain, it is sunny. When it is supposed to be sunny, it rains. There is no one time, no right time anymore."

Reliance on impure foods.

The participants have long considered their traditional diet to be healthy, nutritious, and strengthening for the body. Consequently, in the minds of the participants, changes to that diet due to either crop failure or greater availability and reliance on food from the market, are directly linked to new and big illnesses. Almost all participants agreed that there exists a vast difference between the foods that they consumed when they were younger and those that are available for consumption now. They also unanimously agreed that new and big illnesses of recent times are caused by "impure" and "poisonous" foods consumed by people today. According to one participant,

> Earlier, we were very happy with these herbs - we ate, drank, and were healthy. Now food and drinks are poisonous. As far I am concerned, even the medicines are

> poisonous…the illnesses are poisonous – all kinds of illnesses are being discovered…it happens from the food that we consume. Earlier we used to eat finger millet and local mountain grains. We were doing fine. Now we're consuming food from the plains – wheat, rice, processed food…no one knows what all are added to these things. They [people] drink all kinds of things – different types of cold water [soft drinks]. What is in there? There has to be something poisonous; that why all this is happening…we never had such things before. We never even dreamed of all this…now people eat all kinds of food, drink all kinds of water, which is why they suffer from all kinds of illnesses.

This participant, like most others, shared how food habits had changed over time in tandem with the changing availability of food products. Earlier, people would buy whole spices/roots and process them at home by drying/roasting and grinding them by hand before use. Now, they are unable to buy raw ingredients such as turmeric root, coriander, cumin, and chilies, and end up buying powdered versions from the market. All participants believe that "everything is processed" and adulterated because they "don't know what they're [manufacturers] mixing in the powder". They also mentioned that they were poor and could not buy cooking oil, and therefore, "we buy cheap things and that gives us illness."

In addition to concerns about adulterated spices, grains, and oils being sourced from the markets, the participants also expressed disapproval of modern farming methods that use chemical fertilizers to increase yield. According to one participant,

> It is because of food these days. Everything is because of food. It is all processed food these days….they put poison. That is why people fall sick…humans today are the same as the humans of bygone days. So, it is a problem with the food. They put fertilizer in everything. Take vegetables, for example…in the evening the plants are small…they add fertilizer, and the next morning the plant grows…that will obviously make us sick.

Most participants continue to use organic manure for the crops that they cultivate and consume themselves. However, they have had to switch to chemical fertilizers and pesticides for their apple crop as they are cultivated in large quantities for commercial purposes and the plants/yields have been suffering due to changing climatic conditions. According to another participant, "everything is being made with fertilizer. The fruit that is supposed to ripen after two months is ripening two months ahead of time through medicine. So, people will obviously fall sick."

According to the participants, this is true of most fruits and vegetables cultivated commercially these days, and it is harmful to the health of society.

The belief that food is the root cause of most illnesses in recent times is further solidified in the minds of the participants as they see increasing numbers of younger people battling new and big illnesses instead of older adults who, due to their advanced age, should expectedly be more susceptible to illnesses. According to one participant,

> It [new/big illnesses] is not affecting older people much…they [people] are affected more in youth. Food these days is like that. Then they [young people] drink alcohol. No idea what happens inside their bodies. They could be walking around in the morning and die in the evening. Young people are dying. Quite a few of have died.

Generally, it is the younger population that tends to consume non-traditional diets, and therefore, it is not surprising to the participants that they are the ones suffering for it.

Some participants also believed that the younger generation will age quicker and experience illnesses of old age, and maybe even early death, due to the harmful effects of the foods that they consume. According to one participant, "They will become old by the time they're 60-65-55 because they eat the wrong food…[they drink] alcohol. Everything that is food today has fertilizer…" Most participants compared the organic food of their youth with the chemically grown food of current times to explain how it is affecting the health and well-being of people. One participant explained, "I am 87…I don't wear spectacles. These days, kids wear spectacles like old people. This is because of food. There is a problem with food. There is something mixed in food, that is why they are weak." According to the participant, chemically grown food fails to do the basic job of providing nutrition to the body to strengthen its defenses against illnesses.

Impure foods are believed to weaken children, age the younger generations quicker, and result in early mortality. All of these drive people towards modern medicine to find cures and solutions. According to the participants, a number of the new and big illnesses that now require modern medical intervention were easily prevented in earlier times by following traditional lifestyles that included pure food and sustained daily physical activity. A traditional medical practitioner shared the views of the participants. He explained that the change had come about in the last decade or so –

> Maximum ten years…there are no physical ailments here; there are very few. Actually, earlier, ladies and gents…they would bring wood home, go to the jungles, light a fire, so there used to be a lot of physical activity. Now [cooking] gas has reached everywhere. Earlier people would husk the paddy…that was also physical labor. Now rice comes straight [husked and cleaned] from stores. So, because of the end of physical activities, we now have hypertension and diabetes…lifestyle diseases…and food habits have changed; there is more refined food.

In earlier times, pure food provided strength and nutrition to carry out physical activities. Consequently, small illnesses could be managed at home and big illnesses were rare. Now, impure food weakens the body and enables illnesses that only modern medicine can treat.

Decline in physical ability.

In addition to modern conveniences and environmental changes, the third factor making modern medicine a more acceptable option to the participants is that of their own declining physical abilities. Herbs are available in the higher reaches of the mountains and many species have migrated upwards as temperatures have warmed. As a result, they have become even more difficult to procure than before. When combined with new government rules and regulations surrounding medicinal plant harvest, modern medicine appears to be a cheaper, quicker, and less physically taxing option for most people. According to one participant, "we are old. How will we climb such steep terrain? Earlier, when I was young, I roamed all the jungles. But now I can't do it. Even if I walk up a bit, sitting at intervals, I have breathing trouble. How can I go to jungles now?" This participant shared the concerns of others about walking up mountains, often in the snow, with declining body strength.

Some participants mentioned switching occupations as they grew older. For example, one participant shared that, "earlier, I used to have 400-500 sheep. There were 2-3 men [shepherds] to take them grazing. When I couldn't walk around, I stayed there [in the meadows]. There were horses as well. Then when I realized that this work had gone outside of my abilities, I stopped." This participant now runs a grocery store and cultivates apples. Other participants mentioned scaling back on physical work. According to another participant,

> Now I cannot go to the top. I can't walk up to big heights. There is a dearth of oxygen. When they [hired shepherds and the participant's sheep] come down [to participant's

summer residence] to go down [to participant's winter residence], I join them…we go down slowly together.

This participant, like many others, contracts shepherds to look after his sheep. The shepherds accompany the herds to alpine pastures in the summer and bring them back down to lower altitudes in the winter which is when the owners of the sheep join them and help out with caring for the flock.

All participants mentioned that their children are neither available nor able to bring home herbs from the mountains. Therefore, there is nobody in the family that could help even if the participants did want to use herbs. Some participants, however, are able to request their shepherds to bring some. According to one participant,

> The shepherds bring them [herbs]. They are up in the mountains for 6.5 months. They bring them. They recognize plants so we ask them to bring small quantities of what we need. And it is not free. If they smoke *beedi* [indigenous cigarette], we give them some…if they don't accept, then we give them a cup of tea. They are happy to bring them for us. This is their work; they roam the forests with the sheep. They don't have to bring too much, just a little bit…[they last] a long time - a year. We don't have to eat it every day, only when we are sick. The day you get fever, you take some. Once you're better you store it away carefully.

The participants who still have sheep are able to source medicinal plants in this way. They then share these with others who do not have sheep, and therefore, no way to source their own herbs. Most participants said they would use herbs if they had access to them.

The participants' declining physical ability combined with easy access to modern conveniences, the limited or non-availability of herbs, the influence of younger generations, and overall acceptance of changing times and social norms lead them to the use of modern medicine.

Health seeking behavior.

The wide acceptance of modern medicine in the villages has not come about at the expense of folk and traditional medical systems. The folk system is more dominant of the two and is still very much in use, but when required, the traditional medical systems comprising Ayurveda and TTM are also used willingly by the participants. Unlike earlier times, these days modern medicine is the first line of defense for most participants. If it does not work, people turn to folk and/or traditional medicine.

According to a *lama*,

> First they [people] go to the doctor…then they come here as well. They say "do counting and see how it is [what is wrong]"... [or] they go to doctors…then they come to us and say that "we went to the doctor but we are not getting better…what will happen now?" We then tell them to do *puja-paath* [rituals/chants].

The *lama* explains a reversal of trends where people now use modern medicine first, and if that does not work, they seek treatment through religious means. The *lama* goes on to explain that people are often advised by the *lamas* to continue taking medicines while performing rituals as together they will offer greater benefits – "they have to take medicine at the same time. Take medicines and do *puja* [rituals]. Do both together. Both going hand-in-hand will be good. Only *puja* alone cannot help, no? Take medicine at the same time, it will help." However, if this still does not help then,

> There is a separate *paath* [readings/chants] of Lord Buddha…it is a *paath* for medicine. If someone keeps taking medicine and it does not help, if it does not affect the body, then doing the *paath* will allow the body to take [accept] the medicine.

The folk system is therefore sometimes used to make modern medicine work in an individual's body as it is supposed to. The *lama* also mentioned that sometimes people may ask "which medicine should I take for good results?" In such a situation, *lamas* conduct a counting ceremony to determine whether to send the person to the *amchi* for TTM or to a doctor for English medicine. Sometimes they may recommend both and ask an individual to "take one medicine one hour after the other." Other folk systems include the roles of *devi-devtas* (gods-goddesses) and *doli* (palanquin) that serve people in a similar manner by providing advice, guidance, and the mental/emotional peace of knowing that a certain course of treatment has been directed by higher powers.

Like folk medicine, traditional medicine is also a popular recourse for people when modern medicine does not work. According to an Ayurvedic practitioner, "[people try everything else first] then they come here. We are not the first approach". Like government hospitals for modern medicine, the Ayurvedic hospital, also set up by the state government, offers treatments free of cost. It is, however, located in the district headquarters where there are several options for modern medicine as well. Consequently, people first use modern medicine, and when that does

not work, approach traditional medicine practitioners who are knowledgeable about both traditional and modern medicine, and guide people according to their healthcare needs.

Although modern medicine is rapidly replacing herbal, traditional, and folk medicines as people's first line of defense against illnesses, the old systems continue to function in tandem with modern medicine. The primary difference between earlier times and current times is that in the past, modern medicine used to be the last resort and now, it is the first preference for most people. Many older adults continue to resist the use of modern medicine unless absolutely necessary as they either do not trust these or feel that the medicines do not suit them. Most participants, however, seemed to have accepted the fact that younger generations will continue to prioritize modern medicine over the multiple traditional branches of medicine practiced in the region. They understand that times have changed and that younger generations must follow suit.

Chapter 5: Discussion

5.1 Introduction

This chapter discusses the major findings of this study and their implications for the future of the older population in the IHR. Important considerations in the previous chapter included the impacts of environmental, social, and infrastructural changes on the healthcare systems, health seeking behaviors, family structures, traditional lifestyles, indigenous knowledge, and overall aging experience in the IHR. The findings pointed to a rather complex set of interrelated factors that are impacting the lives of the residents and changing the nature of healthcare usage among the residents of the three villages. Following is a brief discussion of each major finding.

5.2 Healthcare Utilization

One of the most interesting findings of the study was the order in which the participants approached the different medical systems available to them. These trends can be understood using Omrans's (2005) epidemiological transition model, Murdock's (1980) theories of illnesses, and Schwartz's (1969) and Subedi's (1989) pattern or hierarchy of resort – all introduced in chapter 2. Additionally, Subedi & Subedi's (1992) theory of incomplete differentiation between competing medical systems in a medically pluralistic society is also helpful in understanding the findings.

According to the participants of this study, in earlier times, people were medically self-sufficient; they were able to diagnose and treat most illnesses that arose from natural causes such as organ deterioration, stress, infection or accidents. For illnesses that could not be cured by herbs alone, it was assumed that they were caused by supernatural elements such as "spirit aggression" (participants reported encounters with the *upri chhaya* or "shadow from above" in forests) or "soul loss" (participants mentioned that sometimes the *lahden* or soul may leave the body temporarily due to a sudden noise/disturbance), and were therefore addressed through the folk system by appeasing gods, spirits, and/or ruling planets. The evocation of divine power usually provided favorable results as people believed that it would alleviate pain, suffering, and hardships. In the villages, these were done by asking questions of *devi-devtas* (gods-goddesses), the village *doli* (palanquin), or by requesting a *ginti* (counting) ceremony at the Buddhist temple. In rare circumstances, people would make the long journey to modern healthcare facilities as a

last resort although, according to the participants, illnesses that required such efforts were few and far between.

This healthcare utilization pattern, from herbal to folk remedies, and finally to modern medicine, follows the traditional pattern of resort whereby people prefer to first use medical systems that are familiar, culturally relevant, and inexpensive, before switching to modern medicine which is unfamiliar, costly, and often the last resort. Sometimes, people may use a combination of options for the same episode of illness because in a medically pluralistic society there exists little differentiation or boundaries between the various overlapping, competing healthcare systems that essentially provide the same services to society (Subedi, 1989; Subedi & Subedi, 1992). This traditional healthcare usage pattern is also reflective of the link between perceived cause of an illness and the corresponding medical system to treat it. Often, if an illness is believed to be caused by natural elements, people may resort to modern medicine. If it is believed to be caused by supernatural elements, folk or traditional medicine may be the first choice, followed by modern medicine or a combination of different systems (Schwartz, 1969; Murdock, 1980; Subedi & Subedi, 1992).

Interestingly, this trend is reversed in modern times, and the residents of the villages are now more likely to first use modern medicine before turning to T/F systems. For all the modernity entering the lives of the participants through modern conveniences, greater awareness, increased interaction with non-villagers, and the influence of younger generations, folk medicine continues to reside at the heart of healthcare options available to the participants. It provides a sense of solace, comfort, peace, and satisfaction among people who, unless they have tried T/F remedies, feel like they have not done all that they can to treat an illness that has been difficult to cure. Many participants mistrust modern medicine as they cannot know what they are ingesting and what other illnesses they might lead to. With T/F medicine however, they have a sense of control over their treatment and are able to derive emotional strength from using a system that has worked for centuries. Consequently, when modern medicine fails, time-tested T/F medical systems come to people's rescue. As many participants shared, belief – pure and complete - is the most essential component of any course of treatment as it has the power to make medicines work and miracles happen. Moreover, sometimes modern medicine may nothing to offer, as was the case with the recent Ebola epidemic in West Africa during which Western medicine was unable to provide vaccines or treatments. Consequently, people preferred to be treated by trusted

traditional healers in their own homes rather than in isolation in treatment centers where people were dying by the dozens (Chan, 2015).

This reversal of trends from the use of modern medicine to H/T/F medicine is similar to the shift in healthcare usage patterns associated with epidemiological transition (Omran, 2005) in developed nations. In the West, the nature of illnesses has undergone a drastic change from predominantly infectious diseases to primarily chronic diseases for which people are increasingly turning to complementary and alternative medicine (CAM) for their effectiveness against chronic health conditions. According to the Chan (2015), this switch is driven by modern medicine itself because modern medicine does not yet have cures for every ailment. Moreover, modern medicine is now frequently criticized for being overly-medicalized and making people feel like a collection of body parts rather than human beings. People are increasingly more suspicious of side effects arising from new drugs; some people mistrust science, such as those against vaccination; some mistrust their doctors and seek second or third opinions; some are dissatisfied with the very little time that their doctors spend with them; and most people constantly receive conflicting messages about the benefits and harms of different diets and food groups. These appear in sharp contrast to traditional medical systems where treatment is customized to one's overall physical, emotional, social, and cognitive health, and illnesses are treated with a combination of diet, exercise, stress reduction, and herbal remedies. Unlike infectious diseases that are caused by agents such as a bacterium, parasite, or virus that can be singled out and treated, non-communicable chronic diseases require much more holistic treatments that traditional medical systems are able to easily provide (Chan, 2015). Consequently, the West is now gradually witnessing a reversed trend whereby people use modern medicine first, and when it remains ineffective, switch to CAM. That this transition has already started in a country that is far from being fully industrialized and modernized to the levels of Western countries is an interesting finding.

5.3 Effects of Modernization

Another important finding of the study centered on the effects of modernization in the region. Like most states around the world, the Indian government has made sustained efforts to industrialize, urbanize, and modernize the country. While this had led to a lot of development-associated progress, it has also brought about unprecedented changes in traditional lifestyles and socio-cultural norms. In the current study, modern conveniences were hailed by most participants

for bringing comfort into people's lives. The residents of the villages can now use electricity and cooking gas instead of wood; they can also channel water from streams through pipes instead of having to fetch buckets of water from the river every day. Additionally, they have access to transportation and communication. While these have certainly made life more convenient, some participants rued the loss of traditional value systems that bound community members together to create an interdependent society where nobody was left to fend for themselves. Many participants were of the opinion that as people gain more independence through modern conveniences, community ties begin to loosen, lives become fragmented, and families break up. Some participants said that while they may have gained some material comforts with progress, they had lost things that were far more valuable, such as joint families and indigenous knowledge.

Interestingly, although modern conveniences were available to the participants, many made limited use of these if their usage incurred costs. For example, almost all households had access to subsidized cooking gas, but they only used it when preparing tea, a quick snack or an unplanned meal for a visitor. For the rest of their cooking needs they used wood because kindling and fallen branches were easily available in the jungles and also because cooking over wood enhanced the taste of food. Similarly, although the villages had electricity, they were often dark after sundown since people preferred not to have to pay for electricity. They were accustomed to using candles and flashlights. Those who had small solar panels installed on their roofs used the electricity generated from these. The same principle applied to water. People had access to tap water from the reservoir that collects water from several streams, but many preferred to wash their utensils and clothes in the narrow stream along which most houses have been built and that flows directly into the river below. Such examples provoke thought about the real utility of modern conveniences in the lives of older adults.

Most participants agreed that of the various modern conveniences available to them, transportation facilities had been a particular boon, especially during the time of seasonal migration. Otherwise, however, modern conveniences had greatly reduced interdependence among people leading to the creation of nuclear families. This also allowed younger family members to be comfortable with having their older family members move to their summer residences for six to eight months as some of the previously physically demanding tasks now

have easy solutions. Many participants, however, felt that this scant amount of comfort and convenience in day-to-day life had come at great social and personal cost.

In considering the study findings, it is important to note the study was not intended to test the applicability of established theoretical frameworks in a particular context, and therefore, was not initially grounded in any particular gerontological theory (e.g., modernization theory). Even so, the findings are reminiscent of Cowgill's much-critiqued modernization theory (1974) that suggests that as a society modernizes the status of its older population declines, especially in relation to health technology, economics, urbanization, and education. Cowgill does go on to state that these trends are often reversed in the most industrialized societies, but since India is still far from becoming a fully modernized country, the application of Cowgill's modernization theory seems apt when trying to understand the changes affecting the lives of people through developmental activities. In fact, the strong impact of modernization on the overall lives of people and their healthcare behaviors in particular was an unexpected yet important finding of this study.

Migration.

The most notable of the previously-mentioned social and personal costs borne by the participants is the migration of younger family members and its influence on family composition, size, and living arrangements. Cowgill (1974) makes the argument,

> Of course it is the young who migrate. Their migration produces physical separation from the parental family and tends to foster the establishment of permanently separate residence, thus breaking down the extended family in favor of the nuclear conjugal unit. Neo-local marriage [a set-up whereby a newly-married couple resides separately from both the man's and the woman's natal families/household] becomes the norm in a modernizing society. Residential separation fosters social and intellectual separation of the generations. (p.13)

This view holds true for the villages where older adults are separated from their younger family members for half the year. It is important to note that the cold winter temperatures are responsible for the half-yearly separation which, in more temperate climates, would otherwise probably be a more permanent arrangement with children living in the cities for education and employment, and older family members living in the mountains all year round. While most participants understood the need for migration in modern times, they did not necessarily endorse

a practice that separated families and their resources, and weakened the multigenerational support structure.

Conversely, it is migration and modern conveniences that have enhanced educational and occupational opportunities for the younger generations. The participants acknowledged this and recognized the need for the younger generation to gain education to get ahead in life. However, not all families possess the means to educate their younger members at top educational institutions so that they may later engage in lucrative professions. Consequently, members of the younger generation may not always be more successful holding a job than they would be if they had pursued a traditional occupation like farming or animal husbandry. Even then, being educated and employed in a bigger town/city accords prestige and social standing, and almost all younger members select that path. The participants, although supportive of their younger family members gaining education and employment, regretted the decline and eventual loss of traditional occupations within the span of one or two generations. A number of participants, especially those who worked with sheep and wool, mentioned that although they had inherited their occupations from their parents and grandparents, they would be the last members of their families to perform the work. Similarly, one apple cultivator, speaking about his grandchildren, said that, "they come, eat, take some, and leave" instead of learning about the different varieties of apples that he cultivates and the different methods/techniques associated with the cultivation of each type. According to Cowgill, 1974, this physical and intellectual distance between generations is one of the fallouts of modernization - it separates families, and younger members rarely regret the loss of centuries worth of indigenous knowledge and skills.

Education.

While formal education is valued and encouraged, it also serves to distance the younger generations from the older generations to the extent that the older generation's traditional knowledge and skills are viewed as "backward" compared to those of the younger generations'. Formal education relies on books and laboratories, whereas older adults' non-formal education is gleaned from life experiences, traditional knowledge, and life skills that have been handed down from one generation to the next. Suddenly, the body of knowledge that was considered integral to survival until fairly recently, is now viewed as irrelevant and unnecessary, while new, relevant and modern knowledge leaves older adults out of its ambit. As a result, younger adults are considered by many older adults to have more intelligence, awareness, and knowhow compared

to the older generations. It is possible that the younger generations share this sentiment as they are the ones who usually devalue traditional knowledge and skills. While the possession of knowledge in itself is not problematic, the feeling of superiority that often accompanies this knowledge and dismisses traditional knowledge as the "outdated", "backward", and "uneducated" views of people who are "foolish" or "talk rubbish" serves to alienate the older generations. This unfavorable view of traditional knowledge by no means implies that older adults are disrespected in the villages, but it does create a hierarchy between those who "know" and those who do not. This supports Cowgill's (1974) argument that a modernizing society always provides more educational opportunities to the young than the old, and that in such a society where "the young are always more knowledgeable, more skilled, more attuned to the times than their elders" (p.15), it is hard to find respect for the non-formal education and knowledge possessed by elders. In the villages, many older adults have accepted and internalized the feeling that because they have no formal education they know less about everything than the younger generations. As a result, they often rely on the younger members of the families to navigate unfamiliar aspects of modern life.

Healthcare.

One such aspect of modern life is modern healthcare. Although modern healthcare has been around for a few decades, its expansion and decentralization, coupled with the changing nature of illnesses, has made it more visible and relevant to the lives of the participants. As with other modern aspects such as communication and technology, many participants rely on their younger family members to help them make healthcare decisions as well as access and use modern healthcare facilities. The younger generations, on their part, harbor biases towards most things modern and greatly shape and influence such decision-making processes at home. The role that the younger generations play in the provision of information also allows them to be skeptical and dismissive of herbal medical knowledge as they themselves lack faith in the efficacy of herbs. Consequently, not only do they not learn about these from the older generations, they also discourage the use of these by their older family members in favor of modern medicine. As mentioned in the previous chapter, the rationale for selecting modern medicine over herbal medicine lies in the former's quick curative abilities compared to the latter's difficulty with first, procuring medicine and second, the slow and long treatment period.

That many elders mistrust the quick-curing characteristics of modern medicine is not reason enough for the younger generations to embrace the ways of the past.

Interestingly, while the younger generations seem confident about the superiority of modern medicine over herbal medicine - a system based on centuries worth of indigenous research but not fully scientifically tested/proven by modern medicine - they are less forceful in their dismissal of folk treatment methods that rest purely on blind faith and belief in the unknown. The primary reason for this is fear as disregard for and disrespect towards unknown yet powerful elements may attract misfortune in the lives of individuals and/or their families. This mindset seems to be at odds with the otherwise seemingly rational reasoning that is used to displace herbal medicine to welcome modern medicine. The researcher interacted with a couple of young adults in their early twenties who mentioned being unable to decide how to view folk medicine – rational thinking makes them skeptical of folk methods, but they have also repeatedly witnessed its effects and heard stories from the past while growing up. Moreover, all members of all families visit the villages in the months of September-October for the *Dussera* festival every year when folk healing methods are practiced in grand ceremonies. Consequently, they find it more difficult to dismiss the folk system out of hand as easily as they do herbal medicine.

5.4 Environmental Changes

As discussed in chapter 2, the roles of climate change, medicinal plant habitat destruction, over-extraction of herbs, and natural/man-made disasters that cause alterations in temperatures, soil conditions, and weather patterns, was an important consideration in this study. These changes adversely impact the growth, regeneration, and availability of herbs, which in turn affects the herbal medical system of the villages. In light of this, it was interesting to find that although environmental changes did have some expected direct and indirect effects, other factors such as modern conveniences, migration, government regulations, and changing food habits also had equally significant impacts.

The primary reason for this finding was that people did not cultivate medicinal plants themselves as most herbs grow best in natural conditions in the wild. As a result, changing environmental conditions did not directly hamper people's ability to access and use herbs. This was done instead by the stringent government regulations that were put in place to curb the smuggling of medicinal plants, which were subsequently relaxed slightly to allow villagers to possess very small quantities of various species. What environmental changes have achieved

instead is the creation of a complex set of relationships between several factors that have adversely affected food crop cultivation to increase reliance on impure foods and beverages (processed spices, grains, cold/soft drinks), and promoted sedentary lifestyles and unhealthy habits that all participants linked with illnesses that only modern medicine can treat and that mostly affect younger generations who also happen to lack faith in herbal healthcare. Consequently, the herbal medical system is automatically discounted in modern times, and modern medicine has gained greater visibility and popularity to treat new and big illnesses.

5.5 Performing Research in the Field

Gaining access to potential participants and recruiting them for the study was easier and less structured than previous envisioned. This was in large part due to the residents' comfort levels in interacting with outsiders arising from their contact with non-residents such as tourists, pilgrims, and trekkers who visit the area every summer, and the large contingent of the armed forces that is based there all year long. Most residents knit and weave a variety of woolen garments every winter to sell to visitors the following summer; they also spend part of the year living in bigger towns at lower altitudes. As a result, they are mostly comfortable interacting with people from outside their villages.

Another reason could have been that the researcher was female. The researcher was readily invited to and included in conversations by the women in the villages who then introduced her to members of their families, neighbors, and friends. A large part of the informal conversations between the researcher and residents of the villages took place with groups of women who, after completing their day's chores, would sit in the late afternoon sun drinking tea, exchanging stories, spinning yarn, knitting, and soaking up the warmth before sunset. The women belonged to different age groups and provided a wealth of information about their villages, festivals, lifestyles, children's aspirations, local crops, wool work, firewood collection, and other aspects of their lives. A few of these women were selected for interviews if they met the eligibility criteria.

The consent process was a particularly interesting one. Upon reaching the location, the researcher, along with the community assistant, spent a couple of days translating the consent form and interview guide to ensure that they would be easily understandable to the participants. While the latter was translated to colloquial Hindi fairly quickly, the former, even after multiple alterations to the language, continued to sound more like a warning rather than reassurance. The

community assistant also seemed mystified as to why all that material needed to be communicated to the participants. His guidance was very straight forward – "if people talk to you, it is because they want to talk. If they don't want to talk, they will tell you so or they will say that they are busy". The researcher did her best to include the relevant information informally in the conversations preceding the interviews, but she did receive a few puzzled looks when she relayed the information. It was, therefore, a relief to have been allowed to acquire verbal consent rather than written consent as the latter would definitely have impacted the recruitment and interview processes. Another reason why this step of the research process may have seemed redundant to the participants could be because before the researcher could even ask the participants if they would like to participate in an interview, the participants would "interview" the researcher herself to find out everything about her - her family, her educational background, place of residence, how she had travelled to the villages, where she was staying, how long she would stay, what she was studying, and so on. As a result, when the researcher finally got around to asking about the interview and introducing the consent material, the participants knew enough about her and her study to not be bothered about consent.

Another aspect of data collection that strayed from the original plan was the scheduling and conducting of interviews. The researcher had a timeline that allowed for time in between scheduling and conducting interviews. Most participants, however, wanted to do the interviews on the spot because they could never be sure if they would be available another day even if they said that they would. Most people had different schedules on different days of the week and, in general, timings are not binding, so scheduling was difficult. Sometimes, interviews were interrupted due to unforeseen circumstances such as cows not coming home in the evening, the death of a village resident or somebody needing help to lure out a snake that had entered their home. In such cases, the researcher had to either reschedule or wait till such time that the participant became free again to continue with the interview. As a result, the researcher did not have a fixed schedule and conducted either single or multiple interviews a day depending on how many people she met each day. The only participants who preferred to scheduled interviews were the ones who ran shops because they wanted to talk when business would be slow – usually late-morning. As a result of conducting multiple interviews on most days, the total duration of the data collection period was shorter than expected.

An interesting aspect about older adults in the villages was that it was rare to find anybody sitting idle. Depending on their physical capacities, all older members played an important economic role within the family or community. Those who were physically strong and mobile would work in the fields, weave, knit or carry goods on their shoulders; women would additionally perform household chores and visit the jungles to forage for necessities. Those who had more restricted mobility would spin yarn, cut/skin apples to dry and store for winter, sort baskets of kidney beans, or offer advice to younger men and women about how certain tasks should be carried out (such as the best way to pave a mud path with bricks to make it strong and lasting). In this way, almost all older adults in the village were able to contribute to their families or community in some way.

5.6 Limitations of the Study

The IHR partially or fully spans ten states in north, northwest, and northeast India, and directly supports tens of millions of people who live in the region. Although everybody is impacted by some common factors, such as climate change, by virtue of inhabiting the IHR, other aspects of people's lives are extremely diverse and vary greatly. Consequently, it is impossible to reach every population and learn about their experiences through research no matter how extensively it is carried out. This study, therefore, is greatly limited in scope. Even then, it provides valuable insight into the lives of some people whose traditional lifestyles and social norms are juxtaposed with rising modernity, and whose experiences may be reflective of other populations that are experiencing similar realities.

5.7 Future Research Directions

As stated above, the lives of people in the IHR can vary greatly. This diversity of experiences can be recorded to some extent by future research. For example, if this study were carried out in villages at slightly lower altitudes where people do not migrate in the winter; or in villages that are not connected by motorable roads; or with a population that cultivates medicinal plants instead of gathering them from the wild; or with a population where the younger generations continue with traditional occupations instead of migrating, then there probably would have been significant variations in the findings of the study. Future research that explores such variations in experiences can only enhance the rather limited knowledge that exists about the hardships faced by older adults in the IHR.

In addition to conducting exploratory research to understand the challenges and opportunities facing people in the region, studies could also be conducted to identify areas that may be targeted through policy changes, such as investing in high quality government-funded education and/or widening the range of employment opportunities available to the younger generations in an effort to address the issue of forced migration. Sometimes, people are apprehensive about sending their daughters to unfamiliar cities for education as they fear for the girls' safety. In such cases, people look for relatives and friends who can keep an eye on their daughter and help her if needed. Failing that, the members of the family may migrate together so that the girl can live at home with her parents while attending school/college. If neither of those options is feasible, the girl may end up not receiving higher education at all. Although the participants of this study did not mention this issue, possibly because the younger generations and their children had already migrated to cities, this is an issue that many girls and their families are faced with in rural areas of the IHR. Sometimes, educational opportunities for both boys and girls may be hampered as the cost of living in cities is much higher than in the villages. Consequently, many families may not be able to afford to send their children to cities. Therefore, greater opportunities for higher education through small schools and colleges in geographical areas that can be reached without long journeys may be something that policy-based research could explore. This also applies to employment opportunities – the ability of the younger generations to live and work closer to home may greatly reduce the burden of migration on older adults.

One possible way to engage different generations and reduce the "intellectual separation" between generations as mentioned by Cowgill (1974) could be to invest in sustainability research in the IHR and use the younger generations for the collection and documentation of data. Environmental sustainability is emerging as an urgent need in the IHR and older adults are best equipped to share traditional knowledge that can help mitigate the impacts of environmental change in the region. If two or more generations work collaboratively to find ways to arrest or reverse some of the environmental damages affecting the region, the benefits could extend well beyond academia to positively impact the lives of people, and also allow older adults to leave behind a legacy that is relevant to modern times.

References

Antman, F. (2012). The impact of migration on family left behind. In A. Constant & K. F. Zimmermann (Eds.), *International handbook on the economics of migration*. Northhampton, MA: Edward Elgar.

Banerji, D. (1981). The place of indigenous and western systems of medicine in the health services of India. *Social Science & Medicine. Part A: Medical Psychology & Medical Sociology*, *15*(2), 109-114.

Badola, H. K., & Aitken, S. (2003). The Himalayas of India: A treasury of medicinal plants under siege. *Biodiversity*, *4*(3), 3-13.

Baker, S. E., & Edwards, R. (2012). How many qualitative interviews is enough? National Center for Research Methods Review Paper, UK.

Basham, A. L. (1976). The practice of medicine in ancient and medieval India. In C. M. Leslie (Ed.), *Asian medical systems: A comparative study* (18-43). Berkeley: University of California Press.

Beals, A. R. (1976). Strategies of resort to curers in South India. In C. M. Leslie (Ed.), *Asian medical systems: A comparative study* (184-200). Berkeley: University of California Press.

Benzie, I., Wachtel-Galor, S. (Eds.). (2011). *Herbal Medicine: Biomolecular and Clinical Aspects.* Boca Raton: CRC Press.

Birks, M., Chapman, Y., & Francis, K. (2008). Memoing in qualitative research probing data and processes. *Journal of Research in Nursing*, *13*(1), 68-75.

Census of India. (2011a). *2011 census data.* Retrieved April 24, 2017, from http://censusindia.gov.in/2011-Common/CensusData2011.html

Census of India. (2011b). *District census handbook, Uttarkashi*. Retrieved April 24, 2018, from http://censusindia.gov.in/2011census/dchb/0501_PART_B_DCHB_UTTARKASHI.pdf

Central Intelligence Agency. (2018). *The world factbook: India*. Retrieved April 24, 2017, from https://www.cia.gov/library/publications/the-world-factbook/geos/in.html

Chahal, J.K., Kunkel, S.R., Subedi, J., Subedi, S., & Whittington, F.J. (2014). Health and healthcare systems. In Kunkel, S. R., Brown, J. S., & Whittington, F. J., *Global aging: Comparative perspectives on aging and the life course* (pp. 129-162). Springer Publishing Company.

Chan, M. (2015). *Opening remarks at the international forum on traditional medicine*. Retrieved March 15, 2018, from http://www.who.int/dg/speeches/2015/traditional-medicine/en/

Chatterji, S., Kowal, P., Mathers, C., Naidoo, N., Verdes, E., Smith, J. P., & Suzman, R. (2008). The health of aging populations in China and India. *Health Affairs*, *27*(4), 1052-1063.

Cowgill, D. O. (1974). The aging of populations and societies. *The Annals of the American Academy of Political and Social Science*, *415*(1), 1-18.

Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into Practice*, 124-130.

Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches*. Thousand Oaks, CA: Sage Publications.

Denzin, N. K., & Lincoln, Y. S. (Eds.). (2011). *The Sage handbook of qualitative research*. Thousand Oaks, CA: Sage Publications.

Deshpande, A. (2000). Does caste still define disparity? A look at inequality in Kerala, India. *American Economic Review*, 322-325.

Dunn, F. L. (1976). Traditional Asian medicine and cosmopolitan medicine as adaptive systems. In C. M. Leslie (Ed.), *Asian medical systems: A comparative study* (133-158). Berkeley: University of California Press.

Emerson, R. M., Fretz, R. I., & Shaw, L. L. (2011). *Writing ethnographic fieldnotes*. Chicago, IL: University of Chicago Press.

Environmental Defense Fund (2018). *How climate change plunders the planet.* Retrieved April 12, 2018, from https://www.edf.org/climate/climate-change-impacts

ENVIS Centre on Himalayan Ecology. (2014). *Indian Himalayan States*. Retrieved May 10, 2018, from http://gbpihedenvis.nic.in/him_states.htm

Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development . *International Journal of Qualitative Methods*, 1-11.

FirstPost. (2015, April 27). *Nepal isn't the big one: Next Himalayan earthquake could be far more serious and closer to home*. Retrieved April 22, 2018, from http://www.firstpost.com/world/nepal-isnt-the-big-one-next-himalayan-earthquake-could-be-far-more-serious-and-closer-to-home-2214286.html

Forrest, J.L., Wikramanayake, E., Shrestha, R., Areendran, G., Gyeltshen, K., Maheshwari, A., Mazumdar, S., Naidoo, R., Thapa, G.J. and Thapa, K. (2012). Conservation and climate change: Assessing the vulnerability of snow leopard habitat to treeline shift in the Himalaya. *Biological Conservation*, *150*(1), 129-135.

Francis, J. J., Johnston, M., Robertson, C., Glidewell, L., Entwistle, V., Eccles, M. P., & Grimshaw, J. M. (2010). What is an adequate sample size? Operationalising data saturation for theory-based interview studies. *Psychology and Health*, *25*(10), 1229-1245.

Frenk, J., & Gomez-Dantes, O. (2011). The triple burden: Disease in developing nations. *Harvard International Review*, *33*(3), 36.

Garg, S., Anand, T., & Singh, R. (2016). Rural training of medical interns or post graduates to address medical manpower deficiency in India: A dilemma. *Amity Journal of Healthcare Management*, *1*(1), 51-56.

Geertz, C. (1973). *The interpretation of cultures*. Basic books.

Gokhale, P., & Kannan, S. (2017). Patenting trends in Indian pharmaceutical industry. *Annals of Library and Information Studies*, *64*(4), 260-267.

Grace, J., Berninger, F., & Nagy, L. (2002). Impacts of climate change on the tree line. *Annals of Botany*, *90*(4), 537-544.

Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field Methods*, *18*(1), 59-82.

Guest, G., Namey, E. E., & Mitchell, M. L. (2012). *Collecting qualitative data: A field manual for applied research*. Sage Publications.

Gupta, P., Sharma, V. K., & Sharma, S. (2014). *Healing traditions of the Northwestern Himalayas*. New Delhi: Springer India.

Gurmet, P. (2004). "Sowa-Rigpa": Himalayan art of healing. *Indian Journal of Traditional Knowledge*, *3*(2), 212-218.

Harish, B. S., Dandin, S. B., Umesha, K., & Pallavi, H. M. (2012-13). Impact of climate change on medicinal plants: A review. *India: University of Horticultural Sciences, Bagalkot, Karnataka*.

Hindustan Times. (2013, August 19). *Himalayan region recipe for disaster*. Retrieved April 28, 2016, from http://www.hindustantimes.com/india/himalayan-region-recipe-for-disaster/story-CO2BLfaLMRQNumz5LeUIqJ.html

International Center for Integrated Mountain Development Foundation. (n.d.). Help save the third pole. *The ICIMOD Foundation*. Retrieved February 22, 2018, from http://www.icimod.org/?q=3491

International Centre for Integrated Mountain Development. (2011). *Glacial lakes and glacial lake outburst floods in Nepal*. Retrieved April 20, 2018, from http://www.icimod.org/dvds/201104_GLOF/reports/final_report.pdf

Indian Himalayas Climate Adaptation Program (IHCAP). (2016). *Climate vulnerability, hazards and risks: An integrated pilot study in Kullu district, Himachal Pradesh*. Retrieved April 20, 2018, from http://ihcap.in/media/Synthesis%20Report-Kullu,%20HP.pdf

Intergovernmental Panel on Climate Change. (2007). *Climate change 2007: Synthesis report*. Retrieved April 20, 2018, from IPCC Fourth Assessment Report: Climate Change 2007: http://www.ipcc.ch/publications_and_data/ar4/syr/en/mains1.html

International Union for Conservation of Nature. (2008). *India's wild medicinal plants threatened by over-exploitation*. Retrieved April 26, 2018, from http://www.iucn.org/content/india%E2%80%99s-wild-medicinal-plants-threatened-over-exploitation

Jain, M., Gupta, S. A., Gupta, A. K., & Roy, P. (2016). Attitude of would-be medical graduates toward rural health services: An assessment from Government Medical Colleges in Chhattisgarh. *Journal of Family Medicine and Primary Care*, *5*(2), 440.

Kakar, S. (2013). *Shamans, mystics, and doctors*. New York, NY: Knopf.

Kala, C. P. (2000). Status and conservation of rare and endangered medicinal plants in the Indian trans-Himalaya. *Biological Conservation, 93*(3), 371-379.

Kashyap, L. (2004). The impact of modernization on Indian families: The counselling challenge. *International Journal for the Advancement of Counselling*, *26*(4), 341-350.

Kuipers, S. E. (1995). *Trade in medicinal plants*. Retrieved April 20, 2018, from http://www.fao.org/docrep/W7261e/W7261e08.htm

Kumar, M. R., & Janagam, D. (2011). Export and import pattern of medicinal plants in India. *Indian Journal of Science and Technology*, *4*(3), 245-248.

Levacher, C. (2014). *Climate change in the Tibetan plateau region: Glacial melt and future water security*. Retrieved April 10, 2018, from http://futuredirections.org.au/wp-content/uploads/2014/05/Climate_Change_in_the_Himalayan_region.pdf

Maikhuri, R. K., Nautiyal, S., Rao, K. S., & Semwal, R. L. (2000). Indigenous knowledge of medicinal plants and wild edibles among three tribal sub communities of the central Himalayas, India. *Indigenous Knowledge and Development Monitor*, *8*(2), 7-13.

Majid, A., & Zahid, S. F. (2014). Low caste in India (untouchables). *South Asian Studies (1026-678X), 29*(1).

Majumdar, K. K., & Kishore, J. (2018). Medical tourism in India and its future prospects. *International Journal of Preventive, Curative and Community Med*icine, *4*(2), 4-8.

Marshall, M. N. (1996). Sampling for qualitative research. *Family Practice,13*(6), 522-526.

Matsuoka, S. (2015). The changing role of a Vaidya (non-codified traditional doctor) in the community health of Kerala, Southern India: comparison of treatment-seeking behaviours between the Vaidya's patients and community members. *Journal of ethnobiology and ethnomedicine*, *11*(1), 57.

Ministry of Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homoeopathy (AYUSH), Government of India. (2018). *About the systems*. Retrieved April, 2018, from http://ayush.gov.in/about-the-systems

Ministry of Health and Family Welfare, Government of India (2013). *National Health Mission (NHM) - National Rural Health Mission (NRHM),* Retrieved April 03, 2018, from http://nhm.gov.in/

Mrinal, N. R., Mrinal, U. S., & Mukherji, B. R. (1995). Traditional healing in India. In L.L. Adler & B. R. Mukherji (Eds.), *Spirit Versus Scalpel. Traditional Healing and Modern Psychotherapy* (73-94) Westport: Bergin & Garvey.

Murdock, G. P. (1980). *Theories of illness: A world survey*. Pittsburgh, PA: University of Pittsburgh Press.

Murdock, G. P., Wilson, S. F., & Frederick, V. (1980). World distribution of theories of illness. *Transcultural Psychiatric Research Review*, *17*(1-2), 37-64.

National Medicinal Plants Board, Government of India. (2009). *Guidelines on good field collection practices for Indian medicinal Plants*. Retrieved April 25, 2018, from http://envis.frlht.org/documents/good_field_collection_practices_booklet.pdf

Navdanya. (n.d.). *Climate change in the Himalayas*. Retrieved April 20, 2018 from http://www.navdanya.org/climate-change/in-the-himalayas

Nielsen, J. Ø., & D'haen, S. A. L. (2014). Asking about climate change: Reflections on methodology in qualitative climate change research published in Global Environmental Change since 2000. *Global Environmental Change*, *24*, 402-409.

Omran, A. R. (2005). The epidemiologic transition: A theory of the epidemiology of population change. *The Milbank Quarterly*, *83*(4), 731-757.

Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2013). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health and Mental Health Services Research*, 1-12.

Patil, A. V., Somasundaram, K. V., & Goyal, R. C. (2002). Current health scenario in rural India. *Australian Journal of Rural Health*, *10*(2), 129-135.

Patton, M. Q. (1990). *Qualitative evaluation and research methods*. Thousand Oaks, CA: Sage Publications.

Patwardhan, K., Gehlot, S., Singh, G., & Rathore, H. C. S. (2011). The Ayurveda education in India: How well are the graduates exposed to basic clinical skills?. *Evidence-Based Complementary and Alternative Medicine*, 1-6.

Phillippi, J., & Lauderdale, J. (2017). A guide to field notes for qualitative research: Context and conversation. *Qualitative Health Research*, *28*(3), 381-388.

Raguram, R., Venkateswaran, A., Ramakrishna, J., & Weiss, M. G. (2002). Traditional community resources for mental health: A report of temple healing from India. *The BMJ*, *325*(7354), 38-40.

Richards, L., & Morse, J. M. (2013). *Readme first for a user's guide to qualitative methods*. Thousand Oaks, CA: Sage Publications.

Rubin, H. J., & Rubin, I. S. (2011). *Qualitative interviewing: The art of hearing data*. Thousand Oaks, CA: Sage Publications.

Saldaña, J. (2009). *The coding manual for qualitative researchers* (No. 14). Thousand Oaks, CA: Sage Publications.

Saini, A. (2016). Physicians of colonial India (1757–1900). *Journal of family medicine and primary care*, *5*(3), 528.

Samal, P. K., Dhyani, P. P., & Dollo, M. (2010). Indigenous medicinal practices of Bhotia tribal community in Indian Central Himalaya. *Indian Journal of Traditional Knowledge*, *9*(1), 140-144.

Sarkar, S. (2010). Climate change and disease risk in the Himalayas. *Himalayan Journal of Sciences*, *6*(8), 7-8.

Sax, W. (2014). Ritual healing and mental health in India. *Transcultural Psychiatry*, *51*(6), 829-849.

Schwartz, L. R. (1969). The hierarchy of resort in curative practices: The Admiralty Islands, Melanesia. *Journal of Health and Social Behavior*, 201-209.

Sharma, E., Chettri, N., Tse-Ring, K., Shrestha, A. B., Jing, F., Mool, P., & Eriksson, M. (2009). Climate change impacts and vulnerability in the Eastern Himalayas. Retrieved January, 2018, from https://www.cbd.int/doc/pa/tools/Climate%20change%20impacts%20and%20vulnerabilities%20in%20the%20Eastern%20Himalayas.pdf

Sheth, D. L. (2004). *Caste, ethnicity and exclusion in South Asia: the role of affirmative action policies in building inclusive societies* (No. HDOCPA-2004-13). Human Development Report Office (HDRO), United Nations Development Programme (UNDP).

Subedi, J. (1989). Modern health services and health care behavior: A survey in Kathmandu, Nepal. *Journal of Health and Social Behavior*, 412-420.

Subedi, J., & Subedi, S. (1992). Institutional pluralism: The incomplete differentiation of health care in Nepal. *Central Issues in Anthropology*, *10*(1), 61-66.

The Nature Conservancy (2018). *Climate change threats and solutions.* Retrieved April 12, 2018, from http://www.nature.org/ourinitiatives/urgentissues/global-warming-climate-change/threats-impacts/

United Nations Development Programme. (2012a). *Bio-cultural community protocol of Danus and Takulis of Jhuni*. Retrieved April 21, 2018, from http://www.in.undp.org/content/india/en/home/library/environment_energy/Jhuni-BCP.html

United Nations Development Programme. (2012b). *Bio-cultural community protocol of the Men-Hing (medicinal plants) of the Monpa (Sartang) of Salari, Arunachal Pradesh*. Retrieved April 21, 2018, from http://www.in.undp.org/content/india/en/home/library/environment_energy/Arunachal-BCP.html

United Nations Framework Convention on Climate Change. (2011). *Fact sheet: Climate change science – the status of climate change scence today*. Retrieved April 24, 2018, from https://unfccc.int/files/press/backgrounders/application/pdf/press_factsh_science.pdf

United Nations, Department of Economic and Social Affairs, Population Division (2015). *World population prospects: Key findings and advance tables*. Retrieved April 24, 2018, from https://esa.un.org/unpd/wpp/Publications/Files/Key_Findings_WPP_2015.pdf

Vaid, D. (2014). Caste in contemporary India: Flexibility and persistence. *Annual Review of Sociology*, *40*, 391-410.

Vaidya, A. D., & Devasagayam, T. P. (2007). Current status of herbal drugs in India: An overview. *Journal of clinical biochemistry and nutrition*, *41*(1), 1-11.

Varshney, V. (2015, April, 26). *'The great Himalayan earthquake', yet to arrive*. *Down To Earth*, Retrieved April 22, 2018, from http://www.downtoearth.org.in/news/-the-great-himalayan-earthquake-yet-to-arrive-49559

Whitehead, T. L. (2005). Basic classical ethnographic research methods. *Cultural Ecology of Health and Change*, *1*, 1-29.

World Health Organization. (2017). *The WHO essential medicines and health products information portal*. Retrieved April 22, 2018, from http://apps.who.int/medicinedocs/en/d/Jh2945e/1.html

World Health Organization. (2018). *Climate change adaptation to protect human health: Bhutan project profile*. Retrieved April 22, 2018, from http://www.who.int/globalchange/projects/adaptation/en/index2.html

Yoshikawa, T. T. (2000). Epidemiology and unique aspects of aging and infectious diseases. *Clinical Infectious Diseases*, *30*(6), 931-933.

Appendix A: Map Depicting Research Location

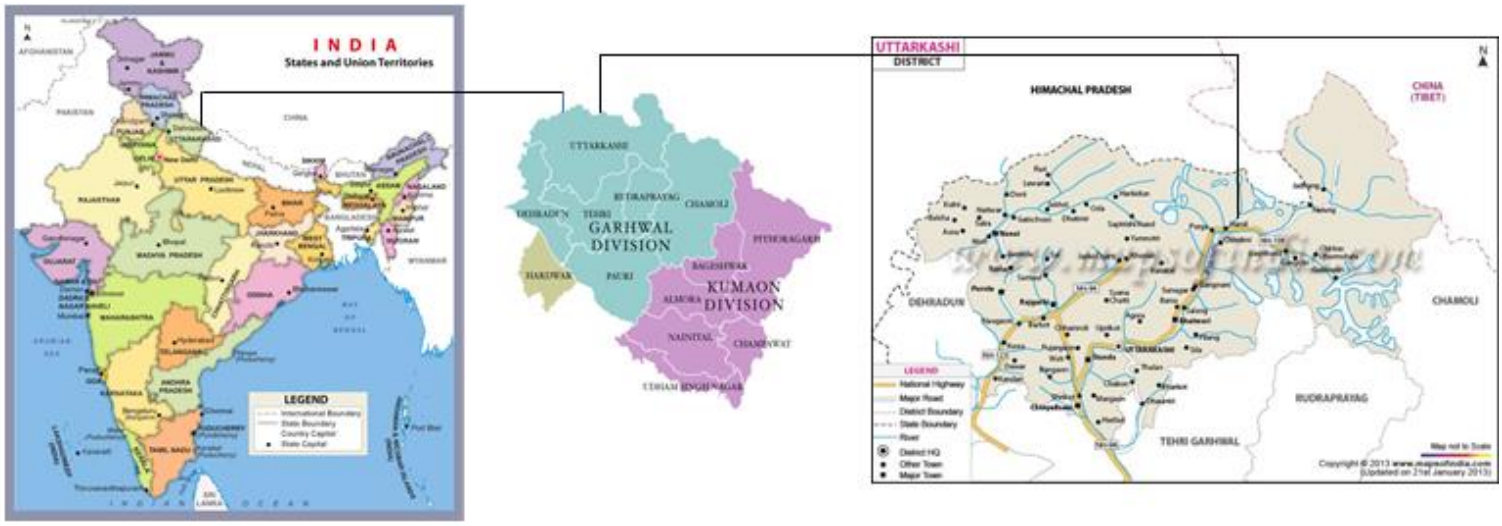


Image sources:

1) Maps of India (https://www.mapsofindia.com/)
2) Google Images

Appendix B: Codebook for Data Analysis

Code Name	Code Description
Availability of medicinal plants in the wild	When participants discussed the availability/changes in availability of medicinal plants in the wild.
Big illness	When participants mentioned illnesses that they had no experience with and those they considered to be illnesses (as opposed to small illnesses).
"Belief is a very big thing..."	When participants mentioned belief as being an important factor in healthcare decision-making as well as in the effectiveness of healthcare services received.
"Children are educated; they know better"	When participants mentioned that children, due to having received formal education, are more knowledgeable about most things than the older generations.
"Children have other things to do..."	When participants mentioned that the younger generations were not interested in learning about herbal medicine/traditional knowledge because they had other, more important things to do with their time.
Cognitive markers of old age	When participants were asked about cognitive issues that they or other older adults in their village currently have or have previously experienced. It includes emotional, mental, and psychological changes.
Cultivation of medicinal plants	When participants answered questions about cultivation of medicinal plants. It includes sale of cultivated medicinal plants.
Daily living	When participants described their daily lives such as daily routines/activities/foods consumed/occupations, etc.
Definition of good health	When participants described their understanding or definition of good health.
Definition of “old”	When participants answered the questions about who they consider old and/or an elder.
Definition/characteristics of illness	When participants defined “illness”. Includes descriptions, names, and examples of conditions/ailments.
Demographic Information	When participants shared information about their age, caste, tribe, place of residence, education, religion etc.
Demographic Information - Village	When village heads shared demographic information about their villages – population, number of households, number of cattle, primary occupations etc.
Development of modern healthcare system	When participants talked about the introduction of modern healthcare in their region. Also includes the use of modern healthcare if it pertains to the development of the region.
Environmental/climate change	When participants described the environmental changes/climate change that they have witnessed in the last few decades. Also includes impacts of such changes on the lives of the participants.

Food as medicine	When participants discussed pure, nutritious food as having medicinal/healing/strengthening properties.
Food as poison	When participants discussed food products as being the root cause of big illnesses, early mortality, and overall decline in health of society.
Interesting quotes	Quotes that captured the essence of the meaning and were illustrative of the participants' experiences.
"In the olden days..."	When participants talked about how things used to be and/or compared older ways of living with current times.
"It is about belief..." - healthcare provider	When folk/traditional/modern healthcare providers talked about the importance of belief in the type of healthcare services participants availed of.
Life values	When participants shared the values and principles that they had lived their lives by and that they had tried to pass on to younger generations.
Miscellaneous	Things that either did not fit into the study or into any other code.
Modern medicine	When participants talked about their views of modern medicine – why they are good or bad, where they are available etc.
Never used herbs	When participants mentioned never having used herbs in their lives.
Physical markers of old age	When participants described physical characteristics or changes that they associated with old age.
Rise of technology/modern conveniences/government programs	When participants mentioned the availability of modern conveniences such as transportation, mobile phones, roads, government programs etc. that had impacted their lives.
Self-rated health	When participants described their current health status and discussed how/why they felt the way they felt.
Small illness	When participants mentioned ailments that they did not necessarily consider being illnesses. These were health concerns that were addressed easily.
The future generations	When participants described how they foresaw the lives of the future generations.
"The children don't listen"	When participants mentioned wanting to impart traditional knowledge to the younger generation but the latter did not pay heed.
"The air is pure here..."	When participants talked about the air, weather/climate, water, lack of pollution, cooler temperatures etc. that they believed to be responsible for the lack of big illnesses in their village/in the area.
"This tradition of migration is a very bad thing..."	When participants discussed the migration of younger generations and the impact of the same on older adults who reside in the villages. Includes participants' personal experiences as well as general view.

Things associated with good health	When participants discussed things such as food, drinks, behaviors, practices, habits, traditions that they associated with good health.
"Times have changed/times are different..."	When participants talked about how changing times had changed their lifestyles, family structures, values, etc. Cross-coded with “In the olden days…”
Traditional knowledge	When participants talked about using and/or sharing traditional knowledge in their daily lives. Includes examples of both traditional medical and non-medical knowledge.
Unsustainable harvest of medicinal herbs	When participants discussed topics related to unsustainable harvesting of herbs from the jungles, sale/trade of such herbs, smuggling of herbs, and corruption among those who are responsible for protecting medicinal herbs.
Use of folk medicine	When participants shared experiences or described the process and use of folk medicine.
Use of folk medicine – healthcare practitioner	When folk practitioners discussed the reasons for which people seek folk medical help and the folk healing process.
Use of herbal medicine	When participant shared knowledge of herbal medicine, recalled incidents from their childhood, and discussed the current status of herbal medicine.
Use of traditional medicine – *vaidya*/*amchi*	When traditional healthcare practitioners discussed the use of traditional healthcare among participants.
"We can't go up to the jungles/mountains anymore"	When participants alluded to the decline in health and strength due to old age as the reason for not being able to climb mountains. This is related to declining usage of herbal medicine. It includes shepherds bringing herbs and people being allowed to possess small quantities of herbs.
"We've never heard of these before"	When participants mentioned never having heard of certain illnesses before.
"When do you see a doctor?"	When participants described the process of healthcare decision-making.

Appendix C: Demographic Information

(Filled in by researcher based on oral answers of key informant interviewees)

Age: _____ years

Gender (circle one) - Male Female

Caste (if applicable): _____

Tribe (if applicable): _____

Highest Level of Education:

- Class _____
- Bachelor's Degree
- Master's Degree
- Doctoral Degree
- Vocational Course – Please specify _____
- Other – Please specify _____

Religion:

- Hinduism
- Buddhism
- Christianity
- Animism
- Sikhism
- Islam
- Jainism
- Other – Please specify _____

Recognized Herbal Practitioner (circle one) - Yes No

Name of Village/City/Town: _____ District: _____

Appendix D: Interview Guide

(Sample questions for data collection - subject to modification as required)

- What is your definition of "old age"? Who, according to you, is an older adult?
- Are there any physical markers of old age? Please explain.
- How do you know if an individual is in good health?
- How do you judge if you yourself are experiencing good health?
- Do you associate certain foods, behaviors, health characteristics, physical abilities, cognitive abilities, or anything else with good health? Please explain.
- How do you ensure good health? Please share some daily habits/practices that keep you healthy.
- Are there certain beliefs and practices that have been passed down through generations to indicate good health or promote good health? If so, can you describe them?
- How do you define "illness" or "sickness"?
- Can you name and describe some physical illnesses that are commonly associated with old age?
- Can you name and describe some cognitive illnesses that are commonly associated with old age?
- What are some common ailments that you, your friends and relatives, or other older adults in your village suffer from? Have they changed over time - since the time of your grandparents or parents? Can you explain the changes?
- [If there are differences in illnesses] Why do you think there are differences? Are people living longer? Have food habits and physical activities changed? Has the availability of healthcare changed?
- How do you treat the ailments that you have mentioned among the current generation of older adults? How did your parents and grandparents treat them?
- [If there are differences in treatments] Why are there differences in treatment? When did the change take place? Why did the change take place? How do you feel about the change?
- What are some new health conditions that older people are suffering from now? How did you learn about these? Where do you seek treatment? When did you begin to see a change in the types of illnesses or symptoms of illnesses among older adults? How do you deal with them?
- For what illnesses do you seek out a recognized practitioner? Which health conditions can you treat on your own?

- What is your preferred method of treatment (herbal/traditional/folk/modern) for illnesses and why?
- How do you decide on the best course of action?
- Do your younger family members use the same healthcare system(s) that you do? If not, why? How do you feel about it?
- Are you concerned about not being able to transfer your medical knowledge to younger generations? What are you doing to ensure that traditional knowledge is preserved and transferred?
- What are some common ingredients (herbs/spices/others) that you use to treat illnesses?
- Have you experienced any changes in the supply of these ingredients (plants) in the last two to three decades? If so, to what factors do you attribute these changes? How have these changes affected you personally (food, livelihood, healthcare)?
- Do you or did you ever grow your own medicinal herbs? If you are not growing them anymore, why not? If you don't grow them, where do you source them from?
- How did you learn about the uses of medicinal plants?
- Do you have any concerns about the traditional healthcare systems that have been an integral part of your life? If so, what are they? How do you deal (or have dealt) with any changes that you have experienced in the availability of these forms of healthcare?

<u>Sample questions for herbal medical practitioners:</u>

- For how long have you been practicing medicine? What is your area of specialization?
- For what illnesses do older adults visit you? Have you noticed any differences in the health conditions that older adults suffer from now compared to 2-3 decades ago? Why do you think that is?
- Do you ever feel like you are unable to treat some new diseases? If so, how do you deal with it?
- Do you make your own medicine? Where do you source your ingredients from (forest/trade centers)?
- Have you noticed a decline in the availability of medicinal plants? Can you describe your experience – from having an abundance of medicinal plants to a shortage?

Appendix E: Consent Script

(Translated into local language)

A student researcher studying at Miami University in the United States of America is conducting dissertation research to learn about the impacts of environmental change on the health and well-being of older adults in three villages. The purpose of the study is to hear from older adults about their experiences, perceptions, thoughts, and concerns regarding the changing nature of medicine in their lives and their communities. The study is not looking to learn about compositions of herbal remedies or the specific details about indigenous treatments and cures.

The researcher, Senjooti Roy, is a doctoral student in Social Gerontology at Miami University, U.S.A. She is not conducting research on behalf of the government, local administration, NGOs, or international organizations.

I am being asked to participate in a face-to-face interview lasting no more than 60 minutes. I will be asked questions about the effect of environmental change on our indigenous healing methods and healthcare decisions. I will not be asked to provide any personal information about my medical history. I can volunteer to share such information if I wish. I will not be asked to share my traditional medical knowledge or the ingredients and compositions of herbal remedies that I use. My participation is entirely voluntary. I can choose not to answer certain questions. I can withdraw from the study at any time I wish. Withdrawal from the study at any point will not result in any negative consequences.

Information about me will not be shared with anybody by the researcher. There are no physical, informational, or alienation risks involved in this study. Data will not be presented in a way that I could be identified. I will be assigned a code that will be used instead of my name. The code list will only be available to the researcher and be stored in a separate location.

The benefits of this study will include the opportunity for older adults like me in my community to share our views on how environmental change is impacting our traditional healthcare system. This will fill an important gap in literature.

Additional information:

The researcher will be the only one to have access to the information. All materials will be stored safely in a locked filing cabinet to which only the researcher will have access. Electronic data will be stored on a separate hard drive and a password secured folder on Miami University's computer network.

Questions about the study can be directed to Senjooti Roy at [phone number].

For any questions regarding my rights as a research participant, or to express concerns about the research process, I may contact the [Village Head] who will contact the Office for the Advancement of Research and Scholarship of Miami University at +1 513-529-3600 or humansubjects@miamiOH.edu.

My verbal consent will be audio recorded. My verbal consent indicates that I have heard the information within the consent form, that I have had the opportunity to ask questions, that my questions have been adequately answered, and that I am willing to participate in this study.

Appendix F: IRB Approval Letter

Roy, Sanjooti <roys3@miamioh.edu>

02215e_Roy and de Medeiros_Exemption Certification - Himalayan Older Adults' Views on Indigenous Medicine - Uses, Availability, and Effects on Health and Well-Being.

Neal Sullivan <sullivnh@miamioh.edu> Thu, Jul 21, 2016 at 3:04 PM
To: roys3@miamioh.edu, demedekb@miamioh.edu
Cc: humansubjects@miamioh.edu

Note: There are no documents attached to this message, this message constitutes your approval letter. Once you have complied with the conditions above, please save or print as a pdf or copy and paste the approval information below to a Word document for your records.

MIAMI UNIVERSITY

Research Compliance Office
102 Roudebush Hall
Miami University, Oxford, OH 45056

21-Jul-16

To: Sanjooti Roy and Kate DeMederios (roys3@miamioh.edu; demedekb@miamioh.edu)

Sociology and Gerontology

RE: *Himalayan Older Adults' Views on Indigenous Medicine - Uses, Availability, and Effects on Health and Well-Being.*

Project reference number is: 02215e
(please refer to this ID number in all correspondence to compliance administration)

The project noted above and as described in your application for registering Human Subjects (HS) research has been screened to determine if it is regulated research or meets the criteria of one of the categories of research that can be exempt from approval of an Institutional Review Board (per 45 CFR 46). The determination for your research is indicated below.

The research described in the application is regulated human subjects research, however, the description meets the criteria of at least one exempt category included in 45 CFR 46 and associated guidance.

The Applicable Exempt Category(ies) is/are: 2

Research may proceed upon receipt of this certification and compliance with any conditions described in the accompanying email message. When research is deemed exempt from IRB review, it is the responsibility of the researcher listed above to ensure that all future persons not listed on the filed application who i) will aid in collecting data or, ii) will have access to data with subject identifying information, meet the training requirements (CITI Online Training).

If you are considering any changes in this research that may alter the level of risk or wish to include a vulnerable population (e.g. subjects <18 years of age) that was not previously specified in the application, you must consult the Research Compliance Office before implementing these changes.