THE IMPACT OF ILLNESS ON LABOUR FORCE PARTICIPATION IN PAKISTAN

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PIDE2018-FMPHILPP12

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2021

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CERTIFICATE

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I Ali Haider Lodhi hereby state that my MPhil thesis titled The Impact of Illness on Labour Force Participation in Pakistan: Policy Suggestions for Public Health is my own work and has not been submitted previously by me for taking any degree from Pakistan Institute of Development Economics or anywhere else in the country/world.

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Date: 2nd September 2021 Ali Haider Lodhi

ACKNOWLEDGEMENT

First, I would like to express my deepest gratitude to my supervisor, Dr. Shujaat Farooq, for his insights and guidance throughout my research at the Pakistan Institute of Development Economics. His expertise was invaluable in helping me formulate the research objectives and methodology, and his insightful feedback pushed me to sharpen my analytical thinking and brought my work to a higher level.

I would also like to thank the Department of Public Policy at the Pakistan Institution of Development Economics and the entire faculty who provided support throughout my MPhil degree and equipped me with the knowledge and tools that I needed to successfully complete my MPhil degree.

I would also like to acknowledge the support of the three health experts, Dr. Numan Ajmal, Dr. Sara Shahzad and Ms. Gul Rukh Mehboob, who agreed to fill out the questionnaires, gave their time and shared their expertise and valuable insights on the subject.

Finally, this journey would not have been possible without the support of my family. I am truly grateful to my parents and siblings for their love and encouragement throughout this process.

ABSTRACT

Poor health has substantial consequences on labour force participation, as health is a major determinant of income and productivity. With the continued presence of communicable diseases and the increasing rate of non-communicable diseases in Pakistan, this double burden of disease imposes severe consequences on individuals' labour force participation. This study estimates and compares the impact of communicable and non-communicable diseases on labour force participation, identifies the determinants of the impact, and analyses the existing policy landscape targeting both diseases and their direct impact on labour force participation in Pakistan. Using the Household Integrated Economic Survey 2013-14 and Out-of-Pocket Health Expenditure Survey 2013-14 administered under the National Health Accounts, the multivariate analysis of the impact of illness on labour force participation shows that there is a significant relationship between illness and labour force participation. In particular, there is a positive relationship between communicable disease and labour force participation and there is a negative relationship between non-communicable disease and labour force participation. The study also examines the indirect impact of both diseases on labour force participation via socio-demographic variables. The results indicate that there is a significant relationship between age, age squared, gender, region, transfers received by the household, highest level of education and province, and labour force participation. In light of the results, the study assesses the existing policy landscape that targets communicable and non-communicable diseases and their direct impact on labour force participation in Pakistan. It analyses three key building blocks to provide a holistic view of the ecosystem surrounding both types of diseases and their impact on labour force participation including governance and policy frameworks, health financing and programmes targeted at communicable and non-communicable diseases. Policymakers can improve the health status of the population, thereby improving labour force participation, by adopting a multi-sectoral policy approach that is effective in reducing the incidence and consequences of both diseases.

Keywords: Health, illness, communicable disease, non-communicable disease, labour force participation

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AIDS	Acquired Immunodeficiency Syndrome
ARDL	Autoregressive Distributive Lag
AJK	Azad Jammu and Kashmir
BISP	Benazir Income Support Programme
BMI	Body Mass Index
FIML	Full Information Maximum Likelihood
GB	Gilgit Baltistan
GHSA	Global Health Security Agenda
GDP	Gross Domestic Product
HIES	Household Integrated Economic Survey
HIV	Immunodeficiency Virus
INGO	International non-governmental organisation
KPK	Khyber Pakhtunkhwa
MNHSRC	Ministry of National Health Services Regulations and Coordination
NHA	National Health Accounts
NGO	Non-governmental organisation
ODA	Official Donor Agencies
OLS	Ordinary Least Squares
OECD	Organisation for Economic Co-operation and Development
OOP	Out-of-pocket
PBS	Pakistan Bureau of Statistics
PKR	Pakistani Rupees
PMT	Proxy Means Testing
SSP	Sehat Sahulat Programme
SDG	Sustainable Development Goal
TB	Tuberculosis
2SRI	Two-Staged Residual Inclusion
UK	United Kingdom
USA	United States of America
UHC	Universal Health Coverage
USD	US Dollar
WHO	World Health Organization

CHAPTER 1

INTRODUCTION

1.1 Background and Introduction

Poor health is defined as a state of suffering from an illness, sickness, injury, disease or any other bodily condition that affects a person's physical, mental, and social well-being (WHO, 1948). Poor health can have substantial economic consequences. At the microeconomic level, poor health can affect households' income, consumption and poverty, firms' revenue or governments' financial ability to provide health services. At the macroeconomic level, it affects labour supply, productivity and the overall health infrastructure of a country. Poor health can be measured by the cumulative impact of diseases on a country's gross domestic product (GDP).

1.1.1 Poor Health at the Microeconomic and Macroeconomic Levels

On the household level, poor health affects households' consumption of goods and services, quality of health, leisure choice and overall change in welfare. Poor health increases a household's consumption of goods and services related to health as out-of-pocket (OOP) expenditure increases, especially in countries with poor health facilities. This increased expenditure on health decreases non-health expenditure. Family members spending time with the ill or the ill unable to work due to sickness decreases the production of goods and this affects their future as well since many families take loans or use their savings to treat illnesses. This causes long-term decreases in household income, savings and assets, which may cause individuals to decrease their investment in capital (Rafique et al., 2018). Poor health not only affects individuals' ability and decision to participate in the labour force but also intra-household

allocations of labour supply (Goryakin & Suhrcke, 2017). Thus, poor health significantly affects labour and human capital to achieve economic growth (Mushtaq et al., 2013).

At the firm's level, poor health can reduce a firm's productivity and the efficiency of its workforce. This could lead to reduced profits and earnings, which decreases the firm's capacity to make new investments and increase its capital in the long run. This would mean lower salaries for workers and reduced profits for owners, thereby reducing overall consumption. Similarly, the government is also affected by poor health. One of the most important tasks of a government is the production of public goods. Poor health can decrease government employees' efficiency, increase the number of absentees and it may lose its employees due to pre-mature death. This could decrease the output of public goods and increase its production costs (WHO, 2009). What further burdens the government is that it has to provide ill workers and their families with health services, unemployment benefits and reduced tax receipts.

It is evident that the labour market is a key institution that affects the link between health and GDP through the household, firm and government levels. Individuals with better health have a greater capacity to work longer, harder and regularly and hence, are more likely to be financially better off than individuals with poor health thereby impacting the overall economic growth (Jack & Lewis, 2009; Nwosu & Woolard, 2017). The negative impact of poor health on labour force participation amplifies social inequalities within and outside the labour market (OECD, 2016). Individuals who are not highly educated and do not have high incomes are more affected by the negative outcomes of poor health on labour force participation (Saliba et al., 2007). Hence, poor health is a source of impoverishment, which further leads to households' asset depletion and income loss. This causes household consumption to fall considerably (Ainsworth & Over, 1997). In the recent decade, the strong link between poor health and impoverishment has made

development agencies argue for more expenditure in the health sector as it directly impacts poverty (World Bank, 2001). This has become a top priority for agencies that are fighting against poverty and want to increase healthcare access for poor people to reduce the burden of disease (WHO, 2002).

1.1.2 Double Burden of Disease in Pakistan

Communicable diseases are infectious diseases produced by microorganisms and can be transferred between individuals (WHO, 2021a). Non-communicable diseases are non-infectious diseases that are a consequence of a combination of genetic, physiological and environmental factors and cannot be spread amongst individuals (WHO, 2021c). There has been a significant increase in prevalence of non-communicable diseases due to a sharp increase in population along with urbanisation and accompanying lifestyle changes (UN, 2011). At least 36 million people die as a result of non-communicable diseases on an annual basis, which makes 63% of global deaths (WHO, 2013a). Poor countries are not only struggling with an increasing rate of non-communicable diseases but they also face an overlapping unfinished task of communicable diseases (Lozano et al., 2012). Both communicable and non-communicable diseases have common risk factors including poverty, unhealthy lifestyle, substance abuse and alcohol (Lim et al., 2012; Murray et al., 2012; Whiting et al., 2011). Comorbidity of communicable and non-communicable diseases is making it difficult for ill-equipped resource settings to tackle both diseases at once (Bygbjerg, 2012; Remais et al., 2013).

Communicable and non-communicable diseases invariably affect low-income countries like Pakistan as they are not financially strong enough to survive the economic costs of diseases, yet measuring the economic impact of health remains underexplored. According to the World Health Organization (WHO), Pakistan faces a double burden of communicable and non-communicable

diseases. Communicable diseases like Human Immunodeficiency Virus (HIV)/Acquired Immunodeficiency Syndrome (AIDS), malaria, dengue fever, typhoid, polio, hepatitis B and C, and tuberculosis (TB) (Sultan & Khan, 2013) account for 33% of all deaths (World Bank, 2019) and non-communicable diseases like heart diseases, diabetes, strokes, cancers, mental disorders, arthritis, injuries and accidents (Rafique et al., 2018) account for 58% of all deaths in Pakistan (WHO, 2020). Around 19% of the population suffers from cardiovascular diseases, 8% has cancer, 6% has some kind of chronic respiratory disease and 3% has diabetes (Azad, 2017). Furthermore, non-communicable diseases are reported to be one of the reasons for mortality and morbidity (Zafar & Malik, 2014) and put an economic strain on the population and health care in Pakistan (Nishtar et al., 2006). In 2019, communicable diseases such as respiratory infections, diarrheal diseases and TB, and non-communicable diseases such as heart disease, stroke, congenital defects, diabetes and kidney diseases were among the top ten causes of disability-adjusted life-years in Pakistan (Vos et al., 2020).

Although the exact impact of the double burden of both diseases is not known, the annual economic disease burden in Pakistan is expected to be more than Pakistani Rupees (PKR) 250 billion (Babar, 2019). This is much higher than the total budget allocation for health of PKR 13 billion for the fiscal year 2019-20, amounting to approximately 0.2% of the government expenditure (GOP, 2018b), whereas WHO advocates allotting 6% of the GDP to improve countries' health care system. The current level of expenditure indicates that the current health care system is lacking in many areas.

With the continued rise in communicable and non-communicable diseases and a rising population, there is an increasing pressure on the public health care system. There has been a decline in the quality of public health care system over the last few decades with Pakistan

ranking 154th among 195 countries across the world in terms of quality and accessibility of healthcare (Government of UK, 2020). The unequal access to health care and the rising costs of health care coupled with the extremely low expenditure on health is likely to increase the double burden of communicable and non-communicable diseases, imposing severe socio-economic consequences on the country at the micro and macro level as described above.

These diseases greatly increase the costs of care as shown in a survey, in which 37.4% of the households spend about PKR 405 on treating communicable diseases while 45.2% of the households spend around PKR 3,935 on treating non-communicable diseases (Rafique et al., 2018). While the OOP expenditure on health services is growing enormously, household income and savings are being depleted and around 4% of the Pakistani population is being pushed towards poverty because of health-related shocks every year. This is more likely in rural areas and this risk increases with household size and lower income levels (Afzal & Yusuf, 2013; World Bank, 2010).

Communicable and non-communicable diseases are impacting labour supply through reduced number of hours worked and lower productivity when at work, thereby leading to a loss in output. This in turn has an impact on national income through impoverishment of households, high health system costs, and productivity losses caused by absenteeism and incapability to work (WHO, 2011). Studies measuring the economic impact of diseases suggest that every 10% increase in non-communicable diseases is related to a 0.5% decrease in GDP (WHO, 2011). Similarly, communicable diseases can have a catastrophic economic impact as has been shown by the COVID-19 pandemic. In fact, the unemployment rate in Pakistan increased by 34.1% and mean income fell by 42% after the lockdown during the first wave of COVID-19 in Pakistan only (Cheema & Rehman, 2021). COVID-19 also had a significant economic impact on micro,

small and medium-sized enterprises operating in Pakistan where over 94% of the enterprises in a survey reported that their businesses had been affected by the pandemic including financial issues, disruptions in supply chains, a fall in demand, and a reduction in sales and profit (Shafi et al., 2020). It is important to recognise the presence of the high burden of such diseases and its impact on labour force participation at the micro and macro level. The impact of health on labour force participation is of policy relevance to budget constrained public health care systems in countries like Pakistan (Handa & Neitzert, 1999).

1.2 Research Problem and Objectives of the Study

The goal of this study is to address the research problem of how communicable and non-communicable diseases affect labour force participation. It aims to estimate, explore and compare the impact of communicable and non-communicable diseases on labour force participation. The specific research objectives are:

- To estimate and compare the impact of communicable and non-communicable diseases on labour force participation.
- To identify the determinants of the impact of communicable and non-communicable diseases on labour force participation.
- To explore the existing policy landscape targeting communicable and non-communicable diseases and their direct impact on labour force participation in Pakistan.

This study will use two health indicators, communicable and non-communicable diseases, instead of just one variable. Since both types of illnesses affect health differently, there is a possibility that both will affect labour force participation differently and through different determinants. To further improve the scope of the research, this study will explore the existing policy landscape targeting communicable and non-communicable diseases and their direct

impact on labour force participation at the national level. This would help give better policy solutions and help policy makers target health interventions from an inter-sectoral perspective.

1.3 Significance of the Study

With the persistence of communicable diseases and an increase in prevalence of non-communicable diseases in Pakistan, there is a need for policymakers to devise policies that are effective in reducing disease incidence and its consequences. Understanding and measuring the impact of illnesses on labour force participation provides key insights into public health policy and areas where Pakistan might be falling behind. The measurement of the impact of illness on labour force participation can provide information on how to allocate resources more efficiently to maximise the benefits. The results of this study can serve to inform public policymaking focused on health care and labour and increase public awareness. Governments may be interested in devising policies that are effective at reducing the incidence and prevalence of illnesses and their economic consequences through targeted interventions. Accurate estimates of the impact of health vis-à-vis communicable and non-communicable diseases can serve as an important tool when conducting cost-benefit analyses of various interventions and ranking alternative policy strategies.

1.4 Organisation of the Study

The thesis will be organised as follows. Chapter 1 begins with the introduction of the thesis. Chapter 2 will review the existing local and international literature related to the topic. Chapter 3 explains the data used, the variables that form the basis of the analyses, and the methodology used. The results and key findings will be addressed in Chapter 4. Based on these findings, an analysis of the existing policy landscape targeting communicable and non-communicable diseases and their impact on labour force participation in Pakistan will be covered in Chapter 5.

Finally, Section 6 provides the conclusion to the thesis, its policy implications and considers potential future research opportunities to better understand the research objectives of the thesis.

CHAPTER 2

LITERATURE REVIEW

This chapter explores the theoretical and empirical aspects of health and its impact on labour force participation with regards to communicable and non-communicable diseases in particular. The first section reviews early literature on the human capital theory of health that lays the foundation of the topic. The second and third sections discuss the existing literature on the impact of health in general and communicable and non-communicable diseases in particular on labour force participation respectively. The fourth section uses existing literature to discuss the national context of health, diseases and labour force participation in Pakistan. Finally, the fifth section discusses the research gap and potential on the topic.

2.1 Human Capital Theory of Health

In the mid-nineties, while studying the human capital theory, researchers realised that an increase in output was only partly explained by an increase in labour and capital output (Fabricant, 1959; Solow, 1957). As time passed, academics started including health as an important component of human capital (Becker, 1962; Schultz, 1961) as health is central to individuals' capacity to develop their skills, capabilities and knowledge (Holt, 2010). They called this component as the health human component (Casasnovas et al., 2005; Mwabu, 2007; Schultz, 1999). This model of health as human capital was further developed by Grossman (1972).

According to Grossman's (1972) contribution to the human capital theory, individuals invest in health for consumption and production benefits. In other words, individuals spend on medical care as not only does better health provide utility but it also allows individuals to have greater earnings (Galama, 2015). This model serves as a conceptual framework for understanding the

demand for health and investment in health in view of certain factors including limited resources, varied preferences and different consumption needs over the life cycle of an individual (Galama, 2015). This model is one of the most significant contributions to the study of health as it provides insights into several concepts related to health including health and education, health and labour force participation, health and socio-economic status, and inequality in health (Case & Deaton, 2007; Cropper, 1977; Galama, 2015; Muurinen & Le Grand, 1985).

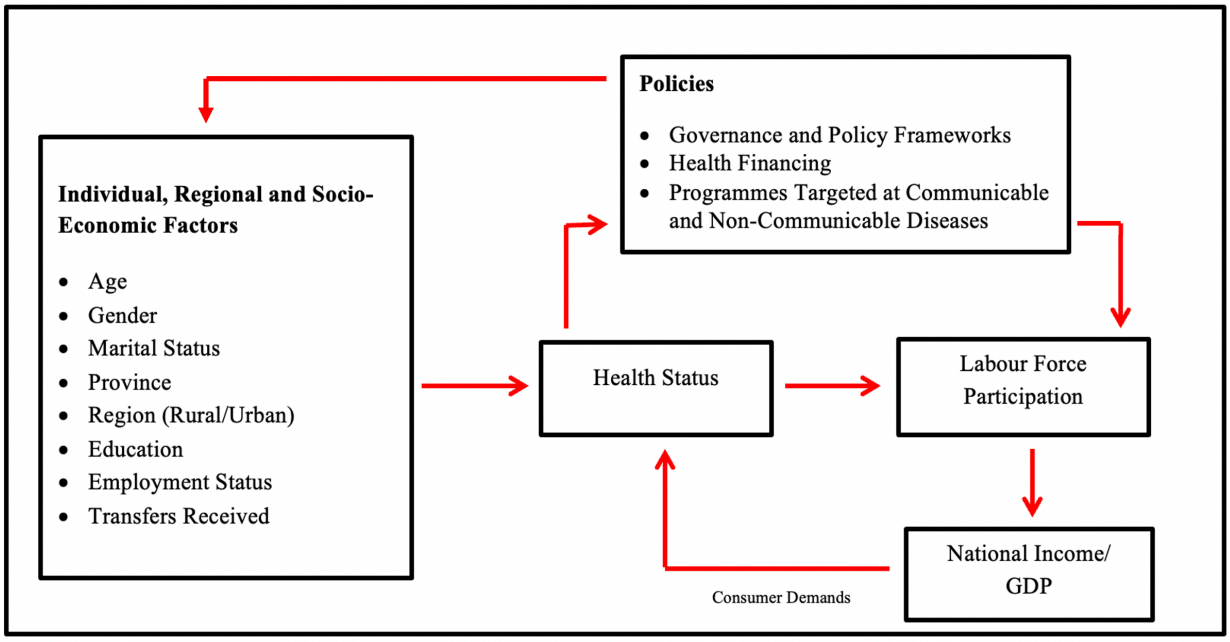


Figure 2.1: Conceptual Framework

The conceptual framework adopted for this study is an adaption of Schultz's (1999) framework and has been modified according to the objectives of this research. Schultz used this framework to assess the impact of health on the labour market. As shown in the diagram above, individual, regional and socio-economic factors influence the health status of an individual, which in turn affects the labour force participation of an individual through various channels (Grossman, 1972; Tellnes, 2005). There is a feedback effect of labour force participation on health status, as labour force participation can define individuals' income and their ability to spend on health to improve

health capital. Policies also play a vital role in defining the relationship between health status and labour force participation.

Given that health is a central component of human capital that is concerned with employers and workers, health is considered as an important factor in influencing individuals' decision to enter, stay in or leave the labour force (Becker, 1962; Grossman, 1972). However, health also affects labour supply decisions because a health shock in the form of an illness may also affect individuals' preferences between work and leisure (Mushtaq et al., 2013) as it affects the total healthy time available to individuals. According to the neoclassical theory of labour, individuals have limited time, which can be allocated either to leisure or to work depending on their preferences and limitations (Cahuc & Zylberberg, 2004). Better health provides individuals with more healthy time whereas ill health can significantly reduce it. Thus, illness influences individuals' labour supply decisions by reducing the healthy time available to them (Cai & Kalb, 2006). Illness can make individuals prefer leisure over work as they need time to improve and recover from the illness (Laplagne et al., 2007).

According to the human capital theory, an individual's productivity is affected by his or her health, whereas productivity defines how well a person can perform at his or her job and how much wage he or she will earn (Becker, 1962; Leibenstein, 1957; Mushkin, 1962; Schultz, 1961). This implies that there is a positive relationship between health and labour force participation indicating that an improvement in health leads to higher labour force participation (Laplagne et al., 2007). Individuals with good health have a higher motivation to participate in the labour force as they can expect higher returns from work (Laplagne et al., 2007). Similarly, poor health leads to lower labour force participation as illness could reduce one's productivity, work performance and wage (Laplagne et al., 2007). A lower wage can affect labour force

participation in two ways. First, lower wage means lower opportunity cost of leisure, therefore increasing the probability of individuals opting for leisure instead of work. Second, a lower wage can force individuals to work more to make up for their lower savings due to a lower income or so that they can pay for their medical bills (Machio, 2014). Individuals suffering from illnesses can also face termination or lack of opportunities due to their lower productivity.

Health also affects labour force participation decisions by determining a person's life expectancy (Suhrcke et al., 2005). Poor health may reduce individuals' life expectancy. On one hand, this makes them work more to make up for the lost time. On the other hand, it may discourage them from being a part of the labour market as they do not expect to live a long life. Hence, the impact of illness via labour force participation in a labour supply model is unclear.

2.2 Impact of Health on Labour Force Participation

While the effect of health on labour force participation is not very decisive, most research seems to indicate that poor health decreases labour force participation (Currie & Madrian, 1999). Therefore, it is essential to identify the effect of health on labour force participation and gain better insights into the link between health and labour force participation, especially in developing countries like Pakistan where there is a high prevalence of communicable and non-communicable diseases (Holt, 2010).

There is a plethora of literature that analyses the impact of individuals' health on labour force participation where most studies focus on the impact of overall health on labour force participation through productivity, life expectancy and the income effect (Rauf et al., 2018). Leung and Wong (2002) conducted analysis of cross-sectional data by developing three models to study the association of health status with labour supply. The findings indicate that health and labour supply are positively related to each other (Rauf et al., 2018). Cai and Kalb (2006) also

studied the impact of health on labour force participation amongst older individuals of working age in Australia. The study adopted a random-effect approach to control for unobserved heterogeneity and found that health status has a significant impact on labour supply (Rauf et al., 2018). Pandey's (2009) study also used the simultaneous equation approach to estimate the relationship between health and labour force participation in India. After using Full Information Maximum Likelihood (FIML) estimation to address the endogeneity issue faced by the health variable, the study found that there both are strongly and positively linked with each other (Rauf et al., 2018).

Studies regarding the effect of health on labour force participation is carried out with samples of different socio-demographic characteristics like age and gender. For example, Cai and Kalb (2004) used the simultaneous equation approach to analyse the impact of health status on labour force participation in different age groups in Australia. The results showed that good health positively impacts labour force participation in sample groups belonging to all ages (Rauf et al., 2018). Similarly, Doğrul (2015) examined the impact of health status on labour force participation among four age-gender groups in Turkey including men between 15-49 years, women between 15-49 years, men between 50-64 years and women between 50-60 years (Rauf et al., 2018). He estimated the health and labour force participation equations simultaneously and then applied the two-stage estimation method to find that health and labour force participation are positively linked within all of the groups of different ages and genders. However, Doğrul (2015) found that the effect was the largest amongst younger women and older men.

Studies analysing the impact of health status on labour force participation amongst the elderly are usually conducted in developed countries with a large elderly population. These countries struggle to retain the elderly population in the labour force and hence, researchers have tried to

study the role of ill health on early retirement (Lindeboom, 2012). Most of these studies use panel survey data to estimate the impact and the advantage of using panel data is that individuals' specific effects can be controlled better, leading to unbiased estimates. Despite this advantage, some of these studies may have underestimated the effect of illness on labour force participation. This is due to the health status variable being potentially endogeneous in the equation of labour force participation (Cai & Kalb, 2006). To tackle this problem, several researchers replaced the potentially endogenous health variable with a constructed latent health stock variable (Disney et al., 2006; Zucchelli et al., 2010). Some studies overcame this estimation by simultaneously estimating the labour force equation and health equation (Cai & Kalb, 2006) while others incorporated the instrumental variable approach (Mete & Schultz, 2002).

Another feature in these studies was the use of self-assessed measures. Mete and Schultz (2002) incorporated the daily living index and a self-evaluation health indicator. In addition to self-reported measures, Au et al. (2005) used the health utility index, which was developed using particular illnesses and circumstances regarding health. The use of measures on self-assessed health is popular among researchers due to the limitations in the available data. While this measure enables researchers to conduct studies even when there are limitations in data, it comes with certain disadvantages. This measure is subjective as individuals assess their health differently. The concept of good health varies from person to person. Another question that arises is what an individual should use as a benchmark when it comes to good health (Machio, 2014). It is important to know that this measure of health may be correlated to the medical facility. To understand this correlation, we need to understand the fact that many people are unaware of their health status unless they visit a medical facility or seek medical advice. Hence,

there exists a strong possibility for a downward bias for individuals with little or no access to health facilities (Machio, 2014).

Various studies considered the impact of health on labour force participation in the elderly population with a gender lens to address the presence of heterogeneity. While some studies suggest that men are more likely to be affected by negative health shocks (Zucchelli et al., 2010), others found that an improvement in health could increase labour force participation in women more than it could in men (Mete & Schultz, 2002). On the contrary, some found that good health affected both genders equally (Au et al., 2005). Finally, some studies have reported mixed findings (Rice et al., 2007). Therefore, we can conclude that there is no consensus among existing literature. The reason for different findings is that these studies have used different health indicators and have limitations of their own.

As compared to studies conducted for the elderly population, some research addresses the effect of health status on labour force participation in the working age population (Currie & Madrian, 1999). While Stern (1989) used data from the United States of America (USA) and United Kingdom (UK) data was employed by Brown et al. (2010), both used the same self-assessed health status to measure health. In addition to that, Stern (1989) incorporated a limits index. The limits index took the value of 1 if an individual was facing difficulty doing the usual amount and type of work because of the illness, and 0 otherwise. Harris (2008) used an Australian dataset and measured health using the presence of chronic health conditions. Zhang et al. (2009) studied the link between chronic illness and the labour market and concluded that men are more affected by chronic illnesses than women when it comes to labour force participation. They also find that the elderly is less likely to be part of the labour force due to chronic illnesses than the younger population.

A lot of these studies faced the common challenge where the health variable turns out to be endogeneous in equations (Machio, 2014). Although self-reported health status is more accurate and less subjective compared to self-assessed health measures but it still faces the issue of endogeneity (Zhang et al., 2009). This problem is dealt with by using the instrumental variable technique that has been used in this study.

2.3 Impact of Specific Diseases on Labour Force Participation

Evidence for the impact of specific diseases on labour force participation is scarce in the literature. Most of the limited evidence focuses on chronic diseases or non-communicable diseases such as cancer (OECD, 2016), musculoskeletal diseases (OECD, 2016), diabetes (Bastida & Pagán, 2002; Kahn, 1998) or mental health (Butterworth et al., 2006; Zhang et al., 2009). Studies indicate that chronic diseases decrease labour force participation through reduced productivity (Casasnovas et al., 2005; Jäckle & Himmler, 2010), mortality and early retirement (Bloom et al., 2020; Dwyer & Mitchell, 1999; Jones et al., 2010; Lindeboom & Kerkhofs, 2009). Moreover, individuals may alter their behaviour regarding labour force participation if they fear that they will fall ill in the future and face the negative effects of illnesses (Bloom et al., 2020; McGarry, 2004).

According to a study conducted by the Organisation for Economic Co-operation and Development (2016) on the state of health in the European Union Cycle, chronic diseases like cardiovascular diseases, diabetes and problems on mental health adversely affect labour force participation by reducing employment, inducing earlier retirement and lowering incomes of individuals with these diseases. Another study conducted by Holt (2010) studied the link amongst nine chronic diseases and labour force participation using standard pooled regression models. The results showed that most of the chronic diseases have a significant but negative

effect on labour force participation, indicating that individuals with these chronic diseases are not only less probable to participate in the labour market but also less probable in terms of working for longer hours (Rauf et al., 2018).

Harris (2008) found that women with cardiovascular diseases have a lower possibility of being in the labour market than men with cardiovascular diseases. He also found that there is a higher inclination of women to participate in the labour force when suffering from diabetes than men. Another cross-country study conducted by Rumball-Smith et al. (2014) found that diabetes raises the probability or likelihood of exiting the labour force by 30% in 16 European countries where the results turned out to be significant in nine out of all 16 countries at the national level. However, the impact of diabetes on labour force participation depends on the severity of the disease. Similarly, Heinesen and Kolodziejczyk (2013) found that people suffering from cancer are unfortunately more probable to leave the labour force by 5 to 10 percentage points compared to people without cancer in Denmark.

Musculoskeletal diseases have been shown to be associated with lower productivity as they accounted for a quarter of the total days lost through absence due to sickness in the UK in 2013 (Jenkins, 2014). Mental health problems reduce individuals' presenteeism or marginal productivity at work and increase sickness absence or the number of hours worked (OECD, 2016). Stewart et al. (2003) found that workers in the USA lose an average of four hours per week due to presenteeism caused by depression and an average of one hour per week due to absenteeism caused by depression. Hence, individuals with mental health problems have a higher likelihood of facing high unemployment than individuals without mental health problems.

2.4 Health, Diseases and Labour Force Participation in Pakistan

There is a major literature gap in Pakistan when it comes to research on the specific impact of health on labour force participation. Majority of the literature in Pakistan focuses on the impact of variables like education and marital status on labour force participation of females (Hafeez & Ahmad, 2002; Naqvi et al., 2002). There are only a few studies that have analysed the impact of illness or health status on labour force participation and these studies mostly use primary data.

Farid et al. (2012) collected primary data from households of the district Bahawalpur to determine factors on human capital that could affect employment in Pakistan. They concluded that along with other variables, health status plays an important role in determining labour force participation. Most of the other studies in Pakistan use the Autoregressive Distributive Lag (ARDL) model to determine the impact of health on labour productivity. Mushtaq et al. (2013) analysed the effect of health on changing labour force participation. It employed the ARDL model to estimate the elasticities in the short as well as long run between the variables during the period of 1975 and 2011. The health variables used in the study include mortality rate, life expectancy, health expenditure and age dependency. The results of the study showed that mortality rate reduces labour force participation in the long run (Rauf et al., 2018). Similarly, Ullah et al. (2019) assessed the impact of health on labour productivity by employing the ARDL approach using data from 1980 to 2010 for Pakistan. They found that an improvement in health by 1% leads to an increase in workers' productivity by 13.39%. Shaheen et al. (2015) conducted a study to investigate the determinants of female employment status. Among other findings, this study concluded that major diseases negatively impact female employment status.

There are a few studies that use health expenditure to explore the association of health with labour force participation. The association between health and GDP of Pakistan was examined

by Akram et al. (2008) by applying co-integration and error correction methods. They concluded that health indicators only affect economic growth in the long run and no significant impact exists in the short run. Mushtaq et al. (2013) studied the impact of health expenditure on labour force participation and the results showed a significant and positive impact of health expenditure on labour force participation in the short run. Similarly, Rauf et al. (2018) used the ARDL approach to find the impact of health expenditure on labour force participation and found that there is a positive connection between health expenditure and labour force participation.

2.5 Research Gap and Research Potential of the Study

Despite the importance of measuring the effect of health on labour supply, the existing literature mostly focuses only on the impact of overall health on labour force participation. Amongst international literature, the summary of measure for overall health used in most studies is self-reported health status i.e. whether an individual is in poor, fair, good or excellent health (Cai & Kalb, 2004; Doğrul, 2015; Rauf et al., 2018). While self-reported health status is more directly linked with productivity, it may also lead to higher reporting biases (Currie & Madrian, 1999). Individuals who have reduced participation in the labour force are more probable to justify their actions by reporting that they have poor health status (Currie & Madrian, 1999). Other factors like education and income influence self-reported health status (Currie & Madrian, 1999). Some studies use indicators like height/weight or Body Mass Index (BMI) as a summary of measure of overall health. For example, Ghatak and Madheswaran (2014) use the nutritional dimension of health as indicated by BMI to study the impact of health on labour supply and wages. Very few studies assess the impact of specific diseases on labour force participation. Thus, the measurement of the impact of health on labour force participation is sensitive to the measure of health and the estimation procedure used. This study avoids these estimation difficulties by

estimating the impact of specific diseases on the labour market through the usage of an instrumental variable.

At the national level, there is limited research that tries to assess the impact of health on labour force participation. Amongst these studies, there are very few that focus on the impact of specific diseases on labour force participation. Most studies focus on the indirect impact of health via socio-demographic factors like age, gender, education, etc. Hence, the direct impact of both diseases on labour force participation is not fully understood and has not been measured with precision. The ambiguity regarding the link concerning the two exists not only due to the difficulty in gauging how the severity of illness varies across the population but also due to the degree to which existing public policies address the incidence and consequences of communicable and non-communicable diseases. Analysis of the effectiveness of current policies and programmes depends on the direct impact of the double burden of disease (communicable and non-communicable diseases) on labour force participation, which will be the focus of this paper. This study is the first study in Pakistan that links illness with labour force participation using a lens of communicable and non-communicable diseases and proposes a novel framework to analyse the impact of illnesses on labour force participation in the context of Pakistan.

CHAPTER 3

DATA SOURCE AND METHODOLOGY

3.1 Introduction

As detailed in Chapter 1, the objectives of this study aim to estimate and compare the impact of illness on labour force participation, to identify the determinants of the impact of illness on labour force participation and to assess the existing policies aimed at directly or indirectly diminishing the impact of illness on labour force participation. Given that poor health can have substantial economic consequences at the microeconomic and macroeconomic levels, this study aims to determine the factors that cause illness to impact labour force participation and assess policies in light of this. This will help policymakers make better decisions regarding policies that are effective at reducing the incidence and prevalence of both diseases in particular, and their impact on labour force participation through targeted interventions.

In view of the objectives set under Chapter 1, this chapter provides details on the data sources and methodological framework to meet the aforementioned objectives. The second section of this chapter includes details on the data source and sampled individuals used for this study; the third section of this chapter provides the empirical model used to estimate the impact of illness on labour force participation; the fourth section defines and describes the variables used in the model; the fifth section of this chapter provides the multivariate analysis and estimation methods used to estimate the impact of illness on labour force participation; and the sixth section discusses the methodology adopted to conduct the policy analysis in Chapter 5.

3.2 Data Source and Sampled Individuals

The study uses data from a provincial level survey conducted by the Pakistan Bureau of Statistics (PBS) in Pakistan, the Household Integrated Economic Survey (HIES) 2013-14, which has been conducted through the Pakistan Social and Living Standards Measurement (PSLM)/HIES surveys under the PSLM project since 2004-05 to provide information on income, consumption and social indicators at the national and provincial levels. The HIES 2013-14 is the sixth round in a series of surveys conducted during the years 2004-05, 2005-06, 2007-08, 2010-11, and 2011-12. Data for HIES 2013-14 was collected between August 2013 and June 2014.

The HIES 2013-14 provides information at the national/provincial level, where it includes data collected from 17,989 households (6234 urban and 11755 rural) based on 1,307 urban and rural primary sampling units (556 urban and 751 rural) in four provinces of Pakistan including Punjab, Sindh, KPK (excluding erstwhile Federally Administered Tribal Areas) and Balochistan. It provides detailed information for socio-economic indicators at the national and provincial levels. Various aspects of household behaviour or welfare have been covered under HIES 2013-14 with survey information, household information, employment and income, household and consumption expenditure, and education covered under both male and female questionnaires. The housing and the consumption module is covered under the male questionnaire only while health regarding children under five years of age, pregnancy, maternity, pre- and post-natal care and family planning are covered under the female questionnaire only.

Although HIES captures information on the employment of individuals and other characteristics, it also captures some information on health. However, this information is limited and it only captures information on female reproductive health and children's health in the female questionnaire, and on some components of the households' health expenditure. It does not

contain information on the types of illnesses contracted by individuals. Hence, in addition to HIES 2013-14, this study also uses data from the OOP Health Expenditure Survey 2013-14 administered under the National Health Accounts (NHA), which is a subset of HIES 2013-14 as as the households covered in both datasets are the same. The OOP Health Expenditure Survey 2013-14 was conducted by appending an additional questionnaire with the standard questionnaire of HIES 2013-14.

NHA is a standard tool to estimate expenditures regarding health care at the national level. It provides information regarding countries' health expenditure including sources of financing, sources that provide financing as well as information on health care providers. The NHA 2013-14 is the fifth round in a series of surveys conducted during the years 2005-06, 2007-08, 2009-10 and 2011-12. Data for HIES 2013-14 was collected between August 2013 and June 2014. For complete coverage and to get reliable estimates of health expenditure by the public and private sectors, a separate household survey on OOP health expenditures by private households was carried out in the fifth round of NHA 2013-14 by including an additional questionnaire under HIES 2013-14.

The OOP Health Expenditure Survey 2013-14 was the third in a series of OOP surveys conducted on health expenditures in Pakistan. It covers all rural and urban areas of all four provinces through a sample of 4,828 households (145 urban and 193 rural). This study uses HIES 2013-14 and OOP survey 2013-14 for the following reasons:

- HIES 2013-14 contains information on employment, education and other individual and household characteristics.

- OOP 2013-14 captures information on the types of illnesses contracted by individuals in the given recall periods, which is necessary to capture information on communicable and non-communicable diseases that are the focus of this study.
- Individual characteristics like age, sex, marital status, etc. available in the HIES 2013-14 survey can be linked to the data from the OOP survey.
- HIES 2013-14 includes information regarding the average distance to a medical facility, which has been used as an instrumental variable to control for unobserved heterogeneity arising due to the possibility of interaction between the health status variable and factors that cannot be observed that can cause the impact of illness on labour force participation to differ amongst individuals. Although this leads to a smaller sample of 2,583 individuals with diseases as explained later in this section, the use of an instrumental variable that meets all of the conditions gives an accurate estimation of the impact of illness on labour force participation and this dataset contains this information.

Although PBS has released the data of HIES 2018-19, it should be noted that the NHA data including the OOP survey has not been released yet. This study could not be conducted without the information on types of illnesses that is available in the OOP survey. Hence, HIES 2013-14 is suitable for the analysis of the impact of illness on labour force participation.

Out of the 85,171 individuals in the HIES 2013-14, the total number of individuals from the four provinces considered in the OOP survey 2013-14 is 8,892 individuals. A total of 8,442 individuals have been considered from the 8,892 individuals who reported some kind of illness (communicable or non-communicable disease) in the OOP survey 2013-14. After considering the age group and the members of households who responded to the question on average distance in kilometres to the medical facility where the household got their child immunised that has been

used as an instrumental variable, the study uses a final sampled population of 42,125 individuals (13,396 urban and 28,729 rural) including individuals with and without any kind of disease and a smaller sub-sample of 2,583 individuals (828 urban and 1,755 rural) who reported having some kind of communicable or non-communicable disease. The use of an instrumental variable in this study is key in estimating the impact of illness on labour force participation as a number of estimation issues including the health variable turning out to be endogeneous and hidden heterogeneity can arise and these need to be addressed by using an instrumental variable. This has been discussed in detail later in this section. The disaggregation of individuals in the sampled population by province and gender are given in Table 3.1 below.

Table 3.1: Number of Individuals in Sampled Population from OOP Health Expenditure Survey 2013-14 and HIES 2013-14

Province	**Male**	**Female**	**Overall**
Punjab	7285	8192	15477
Khyber Pakhtunkhwa	4467	5163	9630
Sindh	5802	5806	11608
Balochistan	2792	2618	5410
Total	**20346**	**21779**	**42125**

Source: Estimated from OOP Health Expenditure Survey 2013-14 and HIES 2013-14

Out of the larger sampled population of 45,125 individuals, there are 2,583 individuals who reported having some kind of communicable or non-communicable disease and are a part of the sub-sample used for this study (1024 male and 1559 female). The disaggregation of individuals in the sub-sample by province and gender are given in Table 3.2:

Table 3.2: Number of Individuals in Sample from OOP Health Expenditure Survey 2013-14 and HIES 2013-14

Province	Male	Female	Overall
Punjab	268	491	759
Khyber Pakhtunkhwa	227	332	559
Sindh	429	564	993
Balochistan	100	172	272
Total	**1024**	**1559**	**2583**

Source: Estimated from OOP Health Expenditure Survey 2013-14 and HIES 2013-14

Out of the sampled population of 42,125 individuals, there are 39,542 individuals who do not have any kind of disease, 1,224 individuals who have communicable diseases and 1,359 individuals who have non-communicable diseases. The disaggregation of individuals in the sampled population by type of disease and gender are given in Table 3.3 below:

Table 3.3: Number of Individuals in Sampled Population by Type of Disease and Gender

Type of Disease	Male	Female	Overall
No Disease	19322	20220	39542
Communicable Disease	597	627	1224
Non-Communicable Disease	427	932	1359
Total	**20346**	**21779**	**42125**

Source: Estimated from OOP Health Expenditure Survey 2013-14 and HIES 2013-14

3.3 Estimating the Impact of Illness on Labour Force Participation

Given that this study estimates the impact of illness on labour force participation with labour force participation being the dependent variable, the basic labour supply model forms the basis of the empirical model used to estimate the impact. Labour force participation is not only affected by labour and non-labour income but also by factors that impact these variables individually and separately. One of those factors is the health status of an individual. Health influences market wage (Becker, 1962; Leibenstein, 1957), an individual's preferences

concerning work and leisure (Cai & Kalb, 2006) and the healthy time available (Grossman, 1972), which in turn influences labour force participation. Hence, this utility-based model of labour supply develops the framework that can help understand workers' labour supply decisions, particularly when they fall ill.

The observed labour force participation variable is defined as:

$$y = \{1 \; if \; an \; individual \; is \; in \; the \; labour \; force \; 0 \; if \; otherwise \} \tag{3.1}$$

An individual's probability of participating in the labour market is denoted by an unobserved variable *y**, that is related to independent variables (*x*) by the following equation:

$$y^* = x\beta + \varepsilon \tag{3.2}$$

Where β is the parameter and ε is the error term. The dependent and independent variables are linked through the equation as follows:

$$y = \{1 \; if \; y^* > 0 \; 0 \; if \; y^* \leq 0 \} \tag{3.3}$$

An individual's probability of being in the labour market is stated in the following way:

$$\Pr(x) = \Pr(y^* > 0|x) \tag{3.4}$$

Inserting equation (3.2) into equation (3.4) gives:

$$\Pr(y = 1|x) = \Pr(\varepsilon > -x\beta|x) = \Pr(\varepsilon < x\beta|x) = F(x\beta) \tag{3.5}$$

The probability of an individual's participation in the labour market depends on the distribution of ε. This model assumes that the error term is normally distributed, leading to a probit model, which has been used to estimate labour force participation. The model estimated can be specified as follows (Mwabu, 2009; Wooldridge, 2001):

$$y = [x_1\beta_1 + \alpha H + \varepsilon_1 > 0] \tag{3.6}$$

$$H = [x_2\beta_2 + \varepsilon_2 > 0] \quad (3.7)$$

Where *y* is the dependent variable, which is observed labour force participation status. *H* and *X* are independent variables where *H* is health status and *X* is a vector of independent variables including x_1 and x_2. x_1 are independent variables included in the labour force equation and x_2 are instrumental variables affecting the health status variable. β_1, β_2 and α are parameters to be estimated and $\varepsilon_1$and ε_2 are disturbance terms.

3.4 Definitions and Description of Variables

This section defines and describes the variables used to estimate the impact of illness on labour force participation. The selection of these variables is based on prior studies on illness and labour force participation identified through the literature review conducted for this study and based on the availability of relevant data.

3.4.1 Dependent Variable

The labour force includes all individuals who are ten years and over and who can be categorised as employed or unemployed during the given period (GOP, 2018b). Observed **labour force participation** is the dependent variable in this model.

It will take the value 1 if an individual is:

- Employed
- Unemployed (seeking work)

It will take the value 0 if an individual is:

- Inactive

3.4.2 Independent Variables

The following variables in the labour force participation equation are the independent variables.

Health status is an important human capital element (Becker, 1962; Schultz, 1961). This component is known as the health human component (López-Casasnovas et al., 2005; Mwabu, 2007; Schultz, 1999). Ill health can make individuals lose healthy time to work, reduce their productivity and hence, lower their wages. Although ill health makes individuals choose leisure over work, in many cases individuals end up working more to cover the medical expenses of ill health. Therefore, health status and labour force participation could be positively or negatively related. To capture the health status, this study runs three models.

Model 1 assesses the effect of disease on participation in the labour force. In Model 1, health status is represented by disease where the disease variable is 1 if an individual has reported having a disease (communicable or non-communicable) and 0 otherwise.

Model 2 assesses the impact of communicable and non-communicable diseases on labour force participation. In Model 2, three dummy variables have been created:

- No disease
- Communicable disease
- Non-communicable disease

No disease variable will take the value of 1 if an individual has not reported having any disease in the past three months or year and 0 otherwise.

Communicable diseases are infectious diseases produced by microorganisms and can be transferred between individuals (WHO, 2021a). The variable will take the value of 1 if an individual has reported having a communicable disease in the past year and 0 otherwise.

Non-communicable diseases are non-infectious diseases that are a consequence of a combination of genetic, physiological and environmental factors and cannot be spread amongst individuals. They tend to be of longer duration in nature and are largely preventable (WHO, 2021c). Non-communicable disease variable will take the value 1 if the respondent reported having a non-communicable disease in the past year and 0 otherwise.

Model 3 compares the impact of both diseases on labour force participation. In Model 3, two dummy variables have been created:

- Communicable disease
- Non-communicable disease

Communicable disease variable will take the value of 1 if an individual has reported having a communicable disease in the past three months or year and 0 otherwise. Non-communicable disease variable will take the value 1 if the respondent reported having a non-communicable disease in the past three months or year and 0 otherwise.

The 27 illnesses given in the data have been categorised according to communicable diseases and non-communicable diseases as shown in Table 3.4 below:

Table 3.4: Types of Communicable Diseases and Non-Communicable Diseases

Communicable Diseases	Non-Communicable Diseases
Diarrheal disorder (including dysentery)	Road Accidents
Pneumonia	Fractures
Flue/Fever	Asthma
Typhoid	Liver, Kidney Diseases
Chest infection	Stroke (Brain haemorrhage)
Measles, Polio (Immunisable diseases)	Muscular Pain (Knee, Arm, Backbone, etc)
Eye infection/disorder (ENT)	Depression/Hypertension
Hepatitis infections	Ulcer diseases
Tuberculosis	Diabetes
Malaria	Heart disease
Dog Bite/Snake bites	High blood pressure
	Women Issue
	Dental Care
	Burns
	Paralysis

Source: Questionnaire of OOP Health Expenditure Survey 2013-14,
National Health Accounts 2013-14

Education is an essential element of human capital as it influences wage, which then affects labour force participation (Mincer, 1958). Since income increases with education, individuals with higher education have a higher probability of being part of the labour market. This means, education and labour force participation have a positive relationship (Bridges & Lawson, 2009; Mugume & Canagarajah, 2005). Education has been divided into seven categories:

- No formal education (an individual never attended school)
- Primary (less than five years of schooling)
- Secondary (six to eight years of schooling)
- Matric/O-Level (nine to ten years of education)
- Intermediate (eleven to twelve years of education i.e. F.Sc/A-Level)

- Degree and above (fourteen or more years of education)
- Other education

A dummy variable exists for each category and takes the value of 1 for individuals who hold that specific education level and 0 otherwise.

Age in this model is used as a representation of work experience. Productivity and skills improve with increase in work experience. This leads to an increase in wage and hence participation in the labour market. However, aging causes productivity to decline, especially in labour intensive jobs, which leads to a decrease in wage. As stated above, the labour force comprises all persons greater than or equal to ten years of age, who can be categorised as employed or unemployed in the given period. Hence, only those individuals have been considered part of the sample, whose age is greater than or equal to ten years.

Gender is also included in this model. Considering illnesses can affect men and women differently due to societal practices, family traditions and religious beliefs, this study compares how illness affects both, male and female, genders. The gender variable takes the value of 1 if an individual has is a male and 0 otherwise.

Marital status is another dummy variable that covers family dynamics in the model. The variable is equal to 1 if the person is married and 0 otherwise. Marriage affects men and women in the workforce differently. Women tend to leave the workforce after marriage due to two reasons. Firstly, marriage increases women's wage as they have another stream of income in the form of their husbands' salary (Glick & Sahn, 1997). Secondly, culturally some women are expected to be homemakers and are discouraged to work alongside men, especially in developing countries. On the contrary, men are expected to work to provide for their family. The marital status variable will take the value of 1 if an individual is married and 0 otherwise.

The **transfers** variable serves as a signal of non-labour income. It is a dummy variable that is equal to 1 if an individual's household received transfers and 0 otherwise. Transfers include:

- Transfers received from the public sector (Federal/Provincial/District/Semi-government)
- Transfers received from the private sector (Relatives/Non-relatives/NGOs/trust, etc.)
- Annual income received from Benazir Income Support Programme (BISP)

A dummy variable for **province** has been included as the labour market can be different in different locations (Bridges & Lawson, 2009). Four dummy variables have been created for provinces and each dummy variable represents one province. The four dummy variables are:

- Punjab
- Khyber Pakhtunkhwa
- Sindh
- Balochistan

A dummy variable for each province takes the value of 1 for individuals reported living in that particular province and 0 otherwise.

A dummy variable for **region (rural and urban)** has also been included in the model for the same reason of including a dummy variable for province. This equals 1 if the individual works in a rural area and 0 otherwise.

3.4.3 Instrumental Variable

The instrumental variable used for communicable and non-communicable disease is the **average distance in kilometres to the medical facility where the household got their child immunised**. Distances (round trip) represent the time spent on receiving health care. Longer distances also signify higher transportation costs, which could lead to a higher cost to treat the

disease, and thus, distance to the medical facility is a proxy of time cost of health care (Strauss & Thomas, 1998). Since HIES 2013-14 and OOP Health Expenditure Survey 2013-14 lack data on the available medical facility/hospitals in the area, this study uses the distances to the medical facility that provides immunisation to children.

This variable satisfies the three conditions required to be used as an instrumental variable; it is not correlated with the error term ε_1, it does not directly affect labour force participation *y* and it is greatly correlated with health status *H*. The F statistics are shown in Table 3.4 indicating the significance of the instrumental variable. Since the P values are low and the F statistics are more than 10 (Machio, 2014; Staiger & Stock, 1997), the instrumental variable is strong.

Table 3.5: F values of Instrumental Variables

Instrument	**Communicable Disease**	**Non-Communicable Disease**
F test for Ho: coefficient on instrument = 0	17.90 (0.0000)	17.90 (0.0000)

P values in parenthesis

Source: Estimated from OOP Health Survey 2013-14 and HIES 2013-14

The following dummy variables have been created for the instrumental variable:

- 0 – 2 km
- 2 – 5 km
- 5 – 10 km
- 10 – 20 km
- 20 + km

Each dummy variable is equal to 1 for individuals reporting distance to be between the given range and 0 otherwise.

3.5 Multivariate Analysis and Estimation Methods

This section deals with the methods used for estimating the impact of illness on labour force participation. A multivariate analysis is conducted to estimate the model and the three estimation methods including the control function approach, the two-staged residual inclusion (2SRI) estimation method and probit regression are explained below.

Using a standard probit model to estimate equation 3.6 can lead to a number of estimation issues:

- Health can turn out to be endogeneous in the labour force participation model due to the presence of simultaneity amongst the health and labour force participation variables, omitted variable bias, and reporting and measurement errors.
- The problem of unobserved heterogeneity could arise in the model if non-linear interaction exists amongst the health variable and factors that are not observable causing the impact of illness on labour force participation to be different amongst individuals. This could lead to underestimation of the impact of illness on labour force participation (Cai & Kalb, 2006) and hence, needs to be taken into account during estimation.

These potential estimation issues have been dealt with by using the control function approach (Card, 2001; Diagne & Diene, 2011; Petrin & Train, 2010). In the first stage, the 2SRI estimation method (Terza et al., 2008) has been used by adopting a valid instrumental variable that is exogenous, strong and relevant (Mwabu, 2009; Wooldridge, 2001). The instrumental variable should not be correlated with labour force participation but it should be strongly correlated with health status. This study uses average distance in kilometres to the medical facility where the household got their child immunised as the instrumental variable.

In the first step of the 2SRI estimation method, the reduced form health status equation (3.7) has first been estimated using Ordinary Least Squares (OLS) regression.

In the second step of the 2SRI estimation method, the labour force participation equation is estimated after including the reduced form residuals (V) as one of the explanatory variables in the labour force participation equation (3.6) to test and address the health variable's possible endogeneity. The health variable is exogenous if the reduced form health equation residuals is tested to be insignificant:

$$y = x_1\beta_1 + \alpha_1 H + \gamma V + \varepsilon_1 \tag{3.8}$$

In the third step of the control function approach, the labour force participation equation is estimated after including the reduced form residual and the interaction term of multiplying health with the error term of health in its reduced form ($H \times V$) as independent variables in the equation (3.8). This yields the following labour force participation equation:

$$y = x_1\beta_1 + \alpha_1 H + \gamma V + \theta(V \times H) + \varepsilon_1 \tag{3.9}$$

The control function approach yields equation 3.9. V addresses unobserved factors that have a correlation with the health variable. $H \times V$ addresses the interactions. The tables in Appendix A show that the marginal effects of the residuals of both communicable and non-communicable disease variables are insignificant. This implies that the health status variable or the communicable and non-communicable disease variables are exogenous. Similarly, the marginal effect of the interaction term is insignificant, indicating that heterogeneity is not a concern in this case. Therefore, the probit regression can be used to empirically identify impact of both diseases on labour force participation.

The estimation methods explained above have been applied to all three models used to assess the impact of illness on labour force participation in this study. Model 1 assesses the impact of disease on labour force participation, Model 2 examines the impact of both types of diseases on labour force participation, and Model 3 compares the impact of both diseases on labour force participation.

3.6 Methodology for Policy Analysis

Based on the results of the multivariate analysis, the study assesses the existing policy landscape that targets communicable and non-communicable diseases and their direct impact on labour force participation in Pakistan. This assessment of the existing policy landscape that targets both types of diseases has been carried out in two steps.

The first step consists of the Delphi method whereby a questionnaire was shared with a panel of key experts. The panel of key experts was selected keeping in view the research objectives of the study while ensuring that they were experts in the health sector of Pakistan and that there was one key expert for each of the three specific policy components being addressed in the policy analysis. Several health experts were contacted but the three experts who agreed to participate in the questionnaire have been included in it: Dr. Numan Ajmal, a health policy expert on communicable and non-communicable diseases at a renowned international agency, Ms. Gul Rukh Mehboob, Technical Advisor for Social Health Protection at a renowned international agency and Dr. Sara Shahzad, a health expert at a renowned international agency.

In this method, a questionnaire including three components with directed short-answer questions was conducted with these three experts. Each component has been scored between 1 and 5 based in the light of responses to questions in corresponding components and classified as latent, nascent, emerging, established or advanced accordingly. The final score is the average of scores

of the three components and is used to classify the overall system as latent, nascent, emerging, established or advanced. This is depicted in an assessment matrix summarising the state of development of Pakistan's public health system from a policy perspective.

In the second step, the insights gathered from the first step have been used to conduct a comprehensive analysis of global and national policies, research articles and evaluation reports providing further detail on the current system and its classification as latent, nascent, emerging, established or advanced through all three components.

CHAPTER 4

IMPACT AND DETERMINANTS OF ILLNESS ON LABOUR FORCE PARTICIPATION

This chapter presents the prevalence of disease in the sampled population through a bivariate analysis and the regression results of the impact of illness on labour force participation through a multivariate analysis of three models: impact of disease on labour force participation, impact of both types of diseases on labour force participation and comparison of the impact of both diseases on labour force participation. In doing so, this section also identifies the determinants or various socio-demographic factors that influence the decision of individuals with communicable or non-communicable diseases about participating in the labour force.

4.1 Disease Prevalence in Sampled Population: A Bivariate Analysis

This section presents the prevalence of disease in the sampled population of 42,125 individuals used in this study. It gives an overview of the overall proportion of individuals in the sampled population who have communicable and non-communicable diseases. It also sheds light on the disease prevalence rate of individuals according to individual characteristics including age, gender and marital status, regional characteristics like province and region, and socio-economic characteristics like education and labour force participation. The results in this section have been weighted by population weights, thus represent the whole population of the country.

4.1.1 Disease Prevalence Rate by Individual Characteristics

Out of the 42,125 individuals in the sampled population, Table 4.1 indicates that 5.9% reported having a disease with around 2.7% of individuals reported having communicable diseases and

Table 4.1: Disease Prevalence Rate by Individual, Regional and Socio-Economic Characteristics (%)

	Communicable Disease	Non-Communicable Disease	Total
Overall	2.7	3.2	5.9
Age			
10-20 years	3.0	0.8	3.7
21-30 years	2.1	3.2	5.3
31-40 years	2.9	2.9	5.8
41-50 years	3.4	4.9	8.3
51-60 years	3.0	6.8	9.8
61 years and above	3.3	7.2	10.4
Gender			
Male	2.6	2.1	4.7
Female	2.9	4.1	7.0
Marital Status			
Married	2.7	4.2	6.9
Unmarried	2.9	1.4	4.3
Region			
Rural	2.7	3.1	5.8
Urban	2.9	3.2	6.2
Province			
Punjab	1.9	3.1	5.1
Khyber Pakhtunkhwa	2.1	3.2	5.3
Sindh	5.2	3.3	8.6
Balochistan	1.6	2.5	4.1
Education			
No formal education	3.0	2.9	6.0
Primary	2.5	3.7	6.2
Secondary	2.2	3.1	5.3
Matric/O-Level	2.2	3.2	5.4
Intermediate	2.2	3.7	5.9
Degree and above	2.3	4.2	6.5
Other education	5.1	0.9	6.0
Labour Force Participation			
In the labour force	2.6	2.4	5.0
Not in the labour force	2.9	3.8	6.6

Source: Estimated from OOP Health Survey 2013-14 and HIES 2013-14

3.2% reported having non-communicable diseases. 4.7% of the sampled population with a disease were male while 7% of the sampled population with a disease were female. While a higher proportion of men (2.6%) than women (2.1%) reported having communicable diseases, a higher proportion of women (4.1%) compared to men (2.9%) have non-communicable diseases. The highest proportion of individuals, about 10.4%, with any kind of disease lies in the age group of 61 years and above. This makes sense as older individuals are more susceptible to disease and hence, are more likely to contract a disease than younger individuals. The same holds true for non-communicable diseases with the highest proportion of individuals with non-communicable diseases who are 61 years and over. A closer look at the sample of individuals with non-

Table 4.2: Type of Non-Communicable Disease of Sampled Individuals by Gender (% Distribution)

Type of Non-Communicable Disease	**Male**	**Female**	**Overall**
Asthma	3.8	3.2	3.4
Liver, Kidney Diseases	12.0	5.9	7.8
Stroke (Brain haemorrhage)	0.9	0.2	0.4
Muscular Pain (Knee, Arm, Backbone, etc.)	23.7	11.5	15.3
Depression / Hypertension	3.5	1.4	2.1
Ulcer diseases	6.3	5.3	5.6
Diabetes	10.3	4.9	6.6
Heart disease	10.8	4.0	6.1
High blood pressure	14.3	7.1	9.3
Women Issue	0.0	52.1	35.8
Dental Care	4.5	1.2	2.2
Road Accidents	4.5	0.6	1.8
Fractures	4.2	1.7	2.5
Burns	0.2	0.1	0.1
Paralysis	0.9	0.9	0.9
Overall	100	100	100

Source: Estimated from OOP Health Survey 2013-14 and HIES 2013-14

communicable diseases in Table 4.2 shows that the most common kind of non-communicable disease that individuals reported having was health issues faced by women, at around 35.8%. This explains why non-communicable diseases are more prevalent in women than men. The next most common non-communicable disease was muscular pain (15.3%) followed by blood pressure (9.3%) and liver/kidney disease (7.8%). While people of all age groups can be affected by non-communicable diseases, the ones that are the most common amongst the sample indicates why they are more prevalent among the elderly population. While the highest proportion of individuals with communicable diseases is also in the age group of 61 years and above (3.3%), this percentage is not very different from the proportion of individuals with communicable diseases in the other age groups, which indicates that communicable diseases are more common in younger individuals compared to non-communicable diseases that are more common in older individuals. A closer look at the sample of individuals with communicable diseases in Table 4.3

Table 4.3: Type of Communicable Disease of Sampled Individuals by Gender (% Distribution)

Type of Communicable Disease	**Male**	**Female**	**Overall**
Diarrheal disorder (including dysentery)	5.2%	7.8%	6.5%
Pneumonia	0.7%	0.3%	0.5%
Flue/Fever	56.6%	58.1%	57.4%
Typhoid	3.5%	2.7%	3.1%
Chest infection	16.1%	13.9%	15.0%
Measles, Polio (Immunisable diseases)	0.3%	0.0%	0.2%
Eye infection/disorder (ENT)	5.7%	4.3%	5.0%
Hepatitis infections	3.7%	3.7%	3.7%
Tuberculosis	1.0%	2.4%	1.7%
Malaria	7.0%	6.9%	6.9%
Dog Bite / Snake bites	0.2%	0.0%	0.1%

Overall	100	100	100

Source: Estimated from OOP Health Survey 2013-14 and HIES 2013-14

shows that the most common type of communicable disease that individuals reported having was a flue/fever, at about 57.4%. Since flue/fever is common among individuals of all age groups, communicable diseases are more common in younger individuals than non-communicable diseases are.

About 7% of the individuals with diseases are married compared to 4.7% of those who are unmarried. A higher proportion of individuals with communicable diseases are unmarried (2.9%) compared to those who are married (2.7%), but a higher proportion of individuals with non-communicable diseases are married (4.2%) compared to those who are unmarried (1.4%).

4.1.2 Disease Prevalence Rate by Regional Characteristics

The highest proportion (8.6%) of individuals with any kind of disease are from Sindh. Most of the individuals with communicable diseases are from Sindh (5.2%) while individuals with non-communicable diseases are spread out over all four provinces from 2.5% to 3.5%. A higher proportion of the sampled individuals with any kind of disease live in urban areas (6.2%) than rural areas (5.8%). Similarly, a higher proportion of individuals with communicable and non-communicable diseases live in urban areas (2.9% and 3.2% respectively) than rural areas (2.7% and 3.1% respectively). This is surprising as one would expect the prevalence of diseases to be higher in rural areas due to socio-economic factors like lack of water and sanitation, lack of education, etc. but there could be other factors at play that go beyond the scope of this study.

4.1.3 Disease Prevalence Rate by Socio-Economic Characteristics

Out of the 42,125 individuals in the sampled population, most individuals with communicable diseases have other education (5.1%) indicating that a lack of education and knowledge of what

communicable diseases are and how they can spread affects how communicable diseases are controlled amongst the population. Most individuals with non-communicable diseases hold a degree and above, which could be because there is a lack of awareness regarding the risk factors of non-communicable diseases even amongst the educated. A higher proportion of individuals with any kind of disease (6.6%) were not participating in the labour force compared to those who were participating in the labour force (5%). Most of the individuals with communicable and non-communicable diseases were not participating in the labour force (2.9% and 3.8% respectively) compared to those who were participating in the labour force (2.6% and 2.4% respectively). This will be further explored in the following section where the study assesses the impact of illness on labour force participation.

4.2 Impact of Illness on Labour Force Participation: A Multivariate Analysis

In this section, three types of results have been provided for three models to assess the impact of illness on labour force participation: the impact of disease on labour force participation, the impact of both types of diseases on labour force participation, and a comparison of the impact of both types of diseases on labour force participation. This section presents probit estimates (marginal effects) only while Appendix A provides all sets of results for all three models including the probit estimates, 2SRI estimates and control function approach estimates. This section investigates the direct impact of health on labour force participation and the indirect effects via socio-demographic variables like age, age squared, gender, region, marital status, transfers received by the household, level of education and province.

4.2.1 Impact of Disease on Labour Force Participation

Model 1 presents the results of the impact of disease on labour force participation in the entire sampled population consisting of 42,125 individuals. The results in Table 4.4 indicate that

individuals with diseases, whether its communicable or non-communicable diseases, are less probable than those who do not have diseases of participating in the labour force. In particular, having diseases decreases the likelihood of participating in the labour force by about 6 percentage points. These findings are in line with conventional theories and most empirical

Table 4.4: Probit Estimates of the Impact of Disease on Labour Force Participation

Variables	Probit (Marginal Effects)	Standard Error
Disease (disease = 1)	-0.0624***	0.0120
Socio-demographic characteristics		
Age	0.0667***	0.0014
Age squared	-0.0008***	0.00002
Gender (male = 1)	0.6046***	0.0049
Marital status (married = 1)	0.0732***	0.0090
Rural area (rural = 1)	0.1490***	0.0062
Transfers (transfers received =1)	0.0932***	0.0103
Education (No formal education is the reference category)		
Primary	0.1020***	0.0095
Secondary	0.0946***	0.0110
Matric/O-Level	0.0496***	0.0101
Intermediate	0.0423***	0.0141
Degree and above	0.1390***	0.0153
Other education	0.1508***	0.0476
Province (Punjab is the reference province)		
Khyber Pakhtunkhwa	-0.1244***	0.0076
Sindh	0.0818***	0.0079
Balochistan	-0.0465***	0.0095
Number of observations	42125	
Wald χ^2	10806.70	
Pseudo R^2	0.3812	

***: significant at 1%, **: significant at 5% and *: significant at 10%

Source: Estimated from OOP Health Survey 2013-14 and HIES 2013-14

evidence. Poor health caused by diseases may lower productivity by reducing the total healthy time available (Grossman, 1972) or influence an individual's inclination towards leisure or work called the substitution effect (Cai & Kalb, 2006).

The results demonstrate that age increases the likelihood of being in the labour market for individuals with diseases. However, the relationship between labour force participation and age squared is negative for individuals with either of the two diseases. This is because although an individual's likelihood of being part of the labour force increases with age, there comes a maximum point beyond which age and labour force participation seem to be negatively related. In theory, investment in human capital and experience increases with age and age picks up this effect, increasing an individual's productivity and thereby increasing their income (Mincer, 1958). An individual with higher income has a higher opportunity cost if they do not choose to be a part of the labour force. However, with time as an individual grows older, the individual's productivity and income begin to decrease, and hence, lowers that cost.

Various studies investigating the relationship between poor health and labour force participation suggest that the impact of poor health on labour force participation varies over the life cycle of an individual (Handa & Neitzert, 1999). On one hand, younger individuals are more likely to participate in the labour force when they fall ill due to the income effect whereby they have to financially sustain themselves and their families (Goryakin & Suhrcke, 2017). On the other hand, older individuals are less likely to participate in the labour force when they fall ill as adverse health events around this age tend to be more serious and they permanently withdraw from the labour force through retirement (Handa & Neitzert, 1999).

Men with diseases are more likely to participate in the labour force than women with diseases. In particular, men are more likely to participate in the labour force by 60 percentage points

compared to women. Women tend to have a low opportunity cost of leisure as they tend to earn less than men due to the presence of wage discrimination in Pakistan. This affects women's probability of participating in the labour force. In addition, women usually rely on their husbands for income (Glick & Sahn, 1997) as men are often the breadwinners of the household, especially in the Pakistani society. This makes sense as Figure 4.1 shows that 74% of the women with diseases are married. The fact that there is a higher likelihood for individuals who are married to choose to be a part of the labour force by 7 percentage points compared to those who are not married indicates that the opportunity cost of not participating in the labour force is high for men, thus married men are more likely to participate in the labour force when they fall ill.

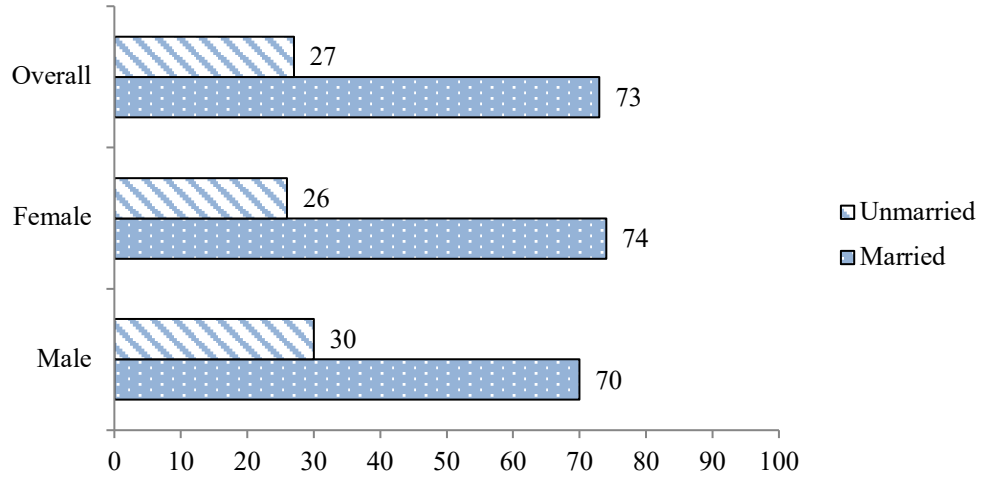


Figure 4.1: Marital Status of Sampled Individuals by Gender (% Distribution)

Source: Estimated from OOP Health Survey 2013-14 and HIES 2013-14

Labour force participation differs by the region individuals live in i.e. rural and urban areas. There is a higher probability that individuals with diseases who are living in rural areas are part of the labour force by 15 percentage points compared to their counterparts living in urban areas. A possible explanation for this is that people living in rural areas usually do not have access to appropriate medical care and insurance programmes that facilitate their withdrawal from the

labour force when they fall ill (Goryakin & Suhrcke, 2017). Another possible explanation for this is related to the income effect, whereby people living in rural areas often earn less than people living in urban areas and thus have a higher opportunity cost if they are not in the labour market.

The results uncover significant effects of transfers received by the household on labour force participation. Individuals with diseases from households that receive transfers have a higher probability of participating in the labour market by 9 percentage points compared to their counterparts from households that do not receive transfers. This is counterintuitive as the labour supply theory suggests that transfers received by households, which is considered as non-labour income, could lead to an increase an individual's income and hence, reduce the possibility of participating in the labour force (Cahuc & Zylberberg, 2004). However, the positive relationship between transfers and labour force participation indicates that there are some other factors that are contributing to this effect. One possible explanation is that a higher reservation wage from receiving transfers allows individuals to fund their medical care. Better medical care could potentially lead to better health, higher productivity and hence, a higher probability of participating in the labour force.

The results also show that there is a significant effect of the education of an individual with diseases on labour force participation. Particularly, individuals who have a degree and above, which is the highest level of education, have a higher likelihood of being part of the labour force by 14 percentage points relative to individuals who do not have any formal education. Furthermore, the results show that there is significant effect of the other categories of education including primary education, secondary education, Matric/O-Level, intermediate and other education, on labour force participation but the strongest effect is for those who have a degree or other education. Higher education is often associated with increased financial prospects leading

to greater access to and willingness to utilise health services, improving health and higher participation in the labour force (Laplagne et al., 2007).

There is less likelihood of individuals living in KPK and Balochistan choosing to be part of the labour force by 12 and 5 percentage points respectively compared to their counterparts living in Punjab whereas there is a greater likelihood of individuals living in Sindh to be part of the labour force by 8 percentage points compared to their counterparts living in Punjab. These relationships could be attributed to the percentage of OOP expenditure in the province. The positive relationship between individuals living in Sindh and labour force participation may be because the share of OOP expenditure by individuals was around 65.50% (GOP, 2016a), which is a substantial amount. Given that a higher proportion of individuals in Sindh have communicable diseases than non-communicable diseases, individuals with communicable diseases living in Sindh would have to spend a major part of their income on utilising health care facilities to treat their medical conditions, the income effect would mean individuals would want to continue to earn an income in order to meet that increased demand for OOP expenditure. This increases the likelihood of individuals living in Sindh participating in the labour force. However, the results show a negative relationship between disease and labour force participation for individuals living in KPK and Balochistan even though the share of OOP expenditure by individuals living in KPK is at around 67.67% and in Balochistan is at 60.49% (GOP, 2016a). This could be because in KPK and Balochistan, a higher proportion of individuals have non-communicable diseases than communicable diseases and the negative relationship between non-communicable diseases and labour force participation indicates that individuals living in KPK and Balochistan would be less likely to participate in the labour force. Other factors could also contribute to this like lack of access to quality health care services that are beyond the scope of this study.

4.2.2 Impact of Communicable Diseases and Non-Communicable Diseases on Labour Force Participation

Model 2 shows the regression results of the impact of communicable and non-communicable disease on labour force participation in the entire sampled population consisting of 42,125 individuals. The results in Table 4.5 indicate that individuals with both diseases are less probable as compared to those who do not have diseases to be a part of the labour force, but the effect of non-communicable disease is stronger. Specifically, having a communicable disease decreases the likelihood of participating in the labour force by about 4 percentage points while having non-communicable disease decreases the likelihood of participating in the labour force by about 8 percentage points compared to those who do not have diseases. These findings are again in line with conventional theories and most empirical evidence as communicable and non-communicable diseases can both diminish the physical and mental capabilities of individuals and disrupt their ability to work, reducing their productivity (Bloom et al., 2020; Jäckle & Himmler, 2010; López-Casasnovas et al., 2005) and preventing them from performing tasks assigned to them on their jobs. Individuals with communicable and non-communicable diseases may also earn less for each hour spent working due to reduced productivity. They cannot devote sufficient time or effort in jobs with higher pays and they may even face discriminatory practices by employers (Chirikos, 1993). Individuals with poor health can find it more difficult to carry out challenging tasks than a person in good health would find tolerable. As a result, individuals with communicable and non-communicable diseases either exit from the labour force altogether or end up reducing the number of hours spent participating in the labour force by taking recurrent sick leave or long-term absence from work (OECD, 2016), which could ultimately lead to termination from employment and eventually the individual's decision to completely withdraw from the labour force (Chirikos, 1993).

Table 4.5: Probit Estimates of the Impact of Communicable and Non-Communicable Disease on Labour Force Participation (% Distribution)

Variables	Probit (Marginal Effects)	Standard Error
Disease (No disease is the reference category)		
Communicable disease	-0.0366**	0.0174
Non-communicable disease	-0.0840***	0.0159
Socio-demographic characteristics		
Age	0.0667***	0.0014
Age squared	-0.0008***	0.00002
Gender (male = 1)	0.6042***	0.0049
Marital status (married = 1)	0.0736***	0.0090
Rural area (rural = 1)	0.1489***	0.0062
Transfers (transfers received =1)	0.0934***	0.0103
Education (No formal education is the reference category)		
Primary	0.1022***	0.0095
Secondary	0.0947***	0.0110
Matric/O-Level	0.0497***	0.0101
Intermediate	0.0428***	0.0141
Degree and above	0.1394***	0.0153
Other education	0.1504***	0.0477
Province (Punjab is the reference province)		
Khyber Pakhtunkhwa	-0.1243***	0.0076
Sindh	0.0811***	0.0079
Balochistan	-0.0464***	0.0095
Number of observations	42125	
Wald χ^2	10811.00	
Pseudo R^2	0.3813	

***: significant at 1%, **: significant at 5% and *: significant at 10%

Source: Estimated from OOP Health Survey 2013-14 and HIES 2013-14

According to the life expectancy approach, health influences individuals' preferences between leisure and work. Having a communicable or non-communicable disease may lower an individual's income and thus, lower their value of time spent at work (Chirikos, 1993). Being ill may increase the value of time outside of work so that they can take care of their health or so that they can spend more time on leisure, reducing the amount of time available for work (Chirikos, 1993). Hence, individuals with poor health may prefer leisure over work, leading to early retirement (Bloom et al., 2020; Dwyer & Mitchell, 1999; Jones et al., 2010; Lindeboom & Kerkhofs, 2009). Since having a communicable or non-communicable disease can affect the life expectancy of an individual, it may also influence the time horizon over which an individual makes economic decisions and the discount rate that an individual uses to calculate assets (Fuchs, 2008). These factors can influence an individual's decision regarding labour force participation as departing from the labour force may seem attractive to an individual with a communicable or non-communicable disease even if the individual can still perform responsibilities at work (Chirikos, 1993).

Interestingly, the indirect effects of the impact of both types of diseases on labour force participation via socio-demographic variables like age, age squared, gender, region, marital status, transfers received by the household, highest level of education and province are the same as the results of Model 1. Amongst individuals with communicable and non-communicable diseases, while people who are older and live in KPK or Balochistan are less likely to participate in the labour force, men who are younger, live in rural areas, receive transfers, hold a degree or above and live in Sindh are more likely to participate in the labour force.

4.2.3 Comparison of the Impact of Communicable and Non-Communicable Disease on Labour Force Participation

Model 3 provides a comparison of the impact of both types of diesases on labour force participation within the sample of 2583 individuals who have either of the disease. Table 4.6 shows varied results in the comparison of the impact of communicable and non-communicable disease signifying heterogeneity of the impact of illness on labour force participation. The results indicate that individuals with communicable diseases are more probable relative to individuals who have non-communicable diseases from being a part of the labour force whereas individuals with non-communicable diseases are less probable relative to individuals with communicable diseases from being a part of the labour force.

Having communicable diseases increases the likelihood of participating in the labour force by 5 percentage points when compared to those who have non-communicable diseases. This is in contrast with conventional theory, according to which poor health is expected to have an adverse effect on labour force participation due to lower productivity and individuals choosing to substitute work for leisure. However, the income effect from lower productivity and hence, lower wages can push labour supply in the opposite direction. In this case, it could be argued that the income effect is taking place where poor health leads to a decline in productivity and hence, a lower income (Becker, 1962; Leibenstein, 1957; Mushkin, 1962; Schultz, 1961). The lower income associated with poor health could lead to an increase in labour supply in order to earn the same level of income that the individual was earning before becoming ill (Cai & Kalb, 2006).

Based on the income effect, it could also be deduced that individuals with communicable diseases need to avail more health care services, which means higher health expenditure, hence, they need to work more in order to earn more and meet the increased demand for health services

Table 4.6: Comparison Probit Estimates of the Impact of Communicable and Non-Communicable Disease on Labour Force Participation

Variables	Probit (Marginal Effects)	Standard Error
Disease (Non-Communicable Disease is the reference category)		
Communicable disease	0.0517**	0.0243
Disease (Communicable Disease is the reference category)		
Non-communicable disease	-0.0517**	0.0243
Socio-demographic characteristics		
Age	0.0623***	0.0047
Age squared	-0.0007***	0.0001
Gender (male = 1)	0.5997***	0.0202
Marital status (married = 1)	0.0353	0.0360
Rural area (rural = 1)	0.1336***	0.0234
Transfers (transfers received =1)	0.0696*	0.0412
Education (No formal education is the reference category)		
Primary	0.0545	0.0356
Secondary	0.0676	0.0483
Matric/O-Level	-0.0034	0.0417
Intermediate	0.0522	0.0558
Degree and above	0.1147*	0.0588
Other education	-0.0042	0.1335
Province (Punjab is the reference province)		
Khyber Pakhtunkhwa	-0.0823***	0.0305
Sindh	0.0728**	0.0297
Balochistan	-0.0557	0.0380
Number of observations	2583	
Wald χ^2	751.19	
Pseudo R^2	0.3546	

***: significant at 1%, **: significant at 5% and *: significant at 10%

Source: Estimated from OOP Health Survey 2013-14 and HIES 2013-14

(Cai & Kalb, 2006; Dwyer & Mitchell, 1999). Higher expected health expenditure for people

with communicable diseases increases the opportunity cost of not working and may explain why having communicable diseases increases the likelihood of individuals choosing to be part of the labour force, thus suggesting that communicable disease and labour force participation are positively related when compared to non-communicable diseases. An increase in health expenditure brings an improvement in an individual's health condition, which further leads to active participation in the labour force. Income and other economic benefits of participating in the labour force may compensate for the added burden of contracting a communicable disease, thus individuals with higher income may be more likely to continue to participate in the labour force when ill than individuals with lower income and hence, lower opportunity costs (Chirikos, 1993).

There are limited studies that find a positive effect of poor health on labour force participation. A study conducted by Pelkowski and Berger (2004) found that while permanent health conditions had a negative impact on labour force participation, temporary health problems had little to no impact on labour force participation (Goryakin & Suhrcke, 2017). Given that most of the communicable diseases included in this study are temporary health problems also known as acute illnesses including diarrheal disorder, pneumonia, flue/fever, typhoid, chest infection, eye infection/disorder, and dog bites/snake bites, it could be argued that individuals with communicable diseases do not feel the need to leave the labour force as they can take sick leave to recover from these temporary diseases. This makes more sense as 57.4% of the individuals who reported having communicable diseases had a flue/fever, which is not a major health condition and is easily treatable. It must be noted that the widespread nature and the debilitating effect of flue/fever can result in sickness absenteeism and loss of productivity at the workplace (Keech & Beardsworth, 2008). Similarly, studies have shown that the COVID-19 pandemic has

had an effect on the labour market as it decreased labour force participation, decreased working hours and increased unemployment (Guven et al., 2020). In a survey conducted through an online job platform, the share of individuals employed fell from 65% pre-COVID to 51% post-COVID while the percentage of individuals looking for employment increased from 68% to 88% (Tas et al., 2021). However, in this case the income effect increases the likelihood of individuals being in the labour market as explained above.

People with non-communicable diseases are lesser probable relative to people who have communicable diseases of being a part of the labour force. In particular, having a non-communicable disease decreases the possibility of people being in the labour market by 5 percentage points compared to those who have communicable diseases. As stated above, these findings are in line with conventional theories and most empirical evidence demonstrating the substitution effect. Non-communicable diseases are mostly chronic diseases that tend to develop slowly, are often progressive in nature and either last a long time or are permanent health conditions. This could be why non-communicable diseases have negative impact on people's decision to participate in the labour force as opposed to communicable diseases, which are usually acute diseases that are sudden and temporary in nature (Machio, 2014). This makes sense as 35.8% of the sample reported having some kind of women issue, the most common type of non-communicable disease in this study. Given that women's health issues tend to be long-term in nature, it affects women's ability to participate in the labour force. For example, studies have found that fertility and maternal health issues decrease women's time in the labour market (Heath & Jayachandran, 2016).

Interestingly, the results of the determinants are similar for both types of diseases when compared to each other and are mostly in line with the results from Models 1 and 2. The

regression results demonstrate that age increases the likelihood of being a part of the labour force for individuals with any of the two diseases. While younger individuals with any of the two diseases are more likely to participate in the labour force when they fall ill due to the income effect, older individuals are less likely to participate in the labour force when they fall ill. The results uncover significant and positive effects for gender, region and transfers as well as it did in Models 1 and 2 described above. The results uncover no significant effects when comparing the impact of marital status, the province of Balochistan and all education categories (except degree and above) on the labour force participation of individuals with communicable (or non-communicable diseases) compared to those with non-communicable diseases (or communicable diseases).

4.3 Summary

This chapter provides the results of the multivariate analysis of the impact of illness on labour force participation. Overall, the results indicate that there is a significant relationship between illness and labour force participation. Model 1 shows that there is a negative relationship between disease and labour force participation, where having a disease decreases the likelihood of participating in the labour force by about 6 percentage points. Model 2 indicates that individuals with any of the two diseases are less probable relative to people who do not have diseases from being in the labour force, but the effect of non-communicable disease is stronger. Specifically, having a communicable disease decreases the likelihood of participating in the labour force by about 4 percentage points while having a non-communicable disease decreases the likelihood of participating in the labour force by about 8 percentage points compared to those who do not have diseases. Finally, a comparison of the impact of communicable and non-communicable disease on participation in the labour force showed that there is a positive

relationship between communicable disease and labour force participation but a negative relationship between non-communicable disease and labour force participation. On one hand, having a communicable disease increases the prospect of people participating in the labour force by 5 percentage points when compared with non-communicable disease, which has been explained by the income effect. On the other hand, having a non-communicable disease decreases the prospect of people participating in the labour market by 5 percentage points when compared with communicable disease, which is in line with conventional theories on productivity and labour-leisure choice or the substitution effect.

This section also highlights the indirect effects of the impact of both diseases on the labour force via socio-demographic variables like age, age squared, gender, region, marital status, transfers received by the household, highest level of education and province. The results of all three models indicate that there is a significant relationship between age, age squared, gender, region, transfers received by the household, highest level of education, province and labour force participation. Amongst individuals with communicable or non-communicable diseases, while people who are older and live in KPK are less likely to participate in the labour force, men who are younger, live in rural areas, receive transfers, hold a degree or above and live in Sindh are more likely to participate in the labour force. The determinants that have been identified play an important role in policy formulation regarding labour force participation. However, apart from education and transfers received by the household, factors like age, age squared, gender, region and province are difficult to change amongst the population. There are numerous studies and policies targeted at improving education levels of the population and improving social protection, but there are limited studies that address the direct impact of both types of diseases on

labour force participation. Drawing on the findings from this chapter, the next section seeks to address this issue.

CHAPTER 5

COMMUNICABLE AND NON-COMMUNICABLE DISEASES IN PAKISTAN: A POLICY ANALYSIS

5.1 Introduction

This chapter assesses the existing policy landscape that targets communicable and non-communicable diseases and their direct impact on labour force participation in Pakistan. The analysis in this section provides some critical information to facilitate policymakers in developing and implementing public policies targeting communicable and non-communicable diseases and their impact, and an insight into potential future policy options to reduce the incidence and address the challenges that the impact of communicable and non-communicable diseases present. It also particularly focuses on policies that provide health protection and preventive services to individuals participating in the labour force. The effectiveness of policies is based on how developed the existing supporting structure and ecosystem is; is the system latent, nascent, emerging, established or advanced. There are three key building blocks with multiple sub-components that provide a holistic view of the ecosystem surrounding both kinds of diseases and their impact on labour force participation as shown in Figure 5.1: governance and policy frameworks; health financing; and programmes targeted at both diseases. This assessment of the existing policy landscape that targets both types of diseases comprises two parts. The first is a questionnaire with directed short-answer questions conducted with key health experts and an assessment matrix summarising the state of development of Pakistan's public health system in terms of governance and policy frameworks; health financing; and programmes targeted at communicable and non- communicable diseases. Each component has been scored

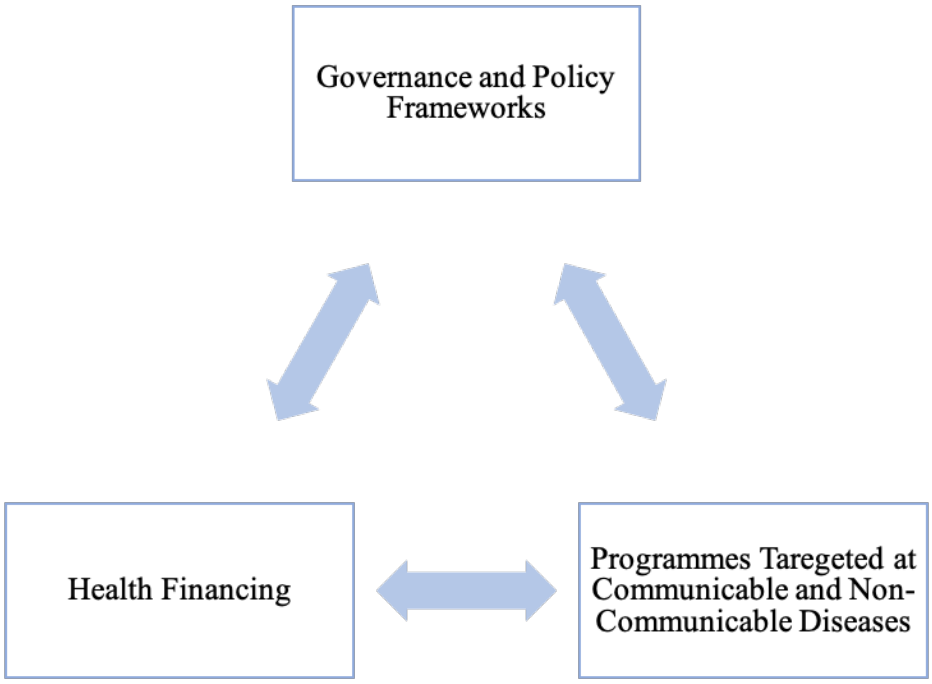


Figure 5.1: Key Building Blocks of the Public Policies Surrounding Communicable and Non-Communicable Diseases

between 1 and 5 based in the light of responses to questions in corresponding components and classified as latent, nascent, emerging, established or advanced accordingly. The final score is the average of scores of the three components and is used to classify the overall system as latent, nascent, emerging, established or advanced. The second is a comprehensive review of global and national policies, research articles and evaluation reports providing further detail on the current system and its classification through all three components.

5.2 Governance and Policy Frameworks for Communicable and Non-Communicable Diseases

Governance and policy frameworks are critical for designing, implementing and monitoring health policies. Global frameworks are universally applicable shared agendas that require global commitment and collective response by countries while developing their own pathways to national targets. They provide countries with the opportunity to focus their political commitment,

develop national plans and policies, set national targets and timeframes to achieve those targets, and create cross-sectoral governance structures for the development and implementation of health policies. Based on the questionnaire filled out by Dr. Numan Ajmal, a health policy expert on communicable and non-communicable diseases in an international agency, the governance and policy frameworks component has been classified as Emerging with an average score of 3.1 as shown in Table 5.1. This indicates that governance and policy frameworks exist but there is a lack of implementation of global and national policies. There are unclear roles and responsibilities and there is a lack of coordination between federal and provincial bodies.

Table 5.1: Scoring Matrix for Governance and Policy Frameworks

Key Building Block	Sub-component	No. of questions	Score	Scoring				
				Latent (1)	Nascent (2)	Emerging (3)	Established (4)	Advanced (5)
Governance and Policy Frameworks	Global Visions and Plans	5	3.1		2.8			
	National Policies and Plans	5				3.4		

This section highlights the existing global and national governance and policy frameworks that shape the incidence of communicable and non-communicable diseases in Pakistan and subsequently their impact on labour force participation.

5.2.1 Global Visions and Plans

There are several global movements and action plans that influence the policy agenda regarding both diseases and their impact on labour force participation in Pakistan at the country level. These include the Sustainable Development Goals (SDGs), the Global Health Security Agenda (GHSA), WHO's Global Action Plan for the Prevention and Control of Non-Communicable Diseases and WHO's Global Plan of Action on Workers' Health. This sub-section discusses

these four frameworks with regards to Pakistan's commitment and progress on the prevention and control of communicable and non-communicable diseases in Pakistan and their impact on labour force participation.

SDG 3 provides an imperative to the government for mobilising efforts to ensure healthy lives and address the socio-economic and environmental determinants of health, which affects the labour sector (UN, 2015). SDG 3 includes relevant targets and indicators aimed at reducing or eliminating communicable and non-communicable diseases. It covers communicable diseases like HIV, TB, malaria, hepatitis B and other tropical diseases. It also covers non-communicable diseases like cardiovascular diseases, cancer, diabetes and chronic respiratory diseases. The risk factors of non-communicable diseases have also been covered through indicators regarding substance abuse disorders, harmful use of alcohol and road traffic injuries. Lastly, it also covers an important aspect under health, which is achieving universal health coverage (UHC).

Pakistan has incorporated the SDGs in its visions, strategies and action plans that will be discussed ahead. However, Pakistan was ranked 134 out of 166 countries in terms of the country's total progress towards achieving all 17 SDGs including SDG 3 in 2020 (Sachs et al., 2020). In terms of SDG 3, Pakistan's score seems to be moderately improving but challenges still remain and progress is insufficient to attain the goal. On one hand, in terms of communicable diseases like TB, major challenges remain and Pakistan seems to have stagnated. On the other hand, Pakistan is on track or maintaining SDG achievement regarding new HIV infections, which is another communicable disease. Similarly, Pakistan is still behind in terms of non-communicable diseases like cardiovascular diseases, cancer, diabetes and chronic respiratory diseases as there are significant challenges and progress seems to have stagnated in this area. Pakistan scored 45 out of 100 on the UHC index of service coverage, which indicates

that major challenges still remain in this area in Pakistan but it is moderately improving (Sachs et al., 2020). Achievement of these targets would not only reduce the incidence of communicable and non-communicable diseases but also increase the probability of participating in the labour force through a reduced income effect, higher productivity and safe employment, working as a driver of inclusive economic growth (WHO & UNDP, 2016).

The changing landscape of public health across the world and the continuous health security threats posed by communicable diseases has led to many challenges, giving rise to the need to achieve international public health security. Launched in 2014, the GHSA is a group of more than 100 countries that have committed to achieve the vision of a world that is safe from public health threats posed by communicable diseases (GHSA, 2014). The GHSA 2024 Framework provides the foundation for GHSA's goals and objectives for 2019-2024 and highlights the ways in which members of GHSA can track progress to achieve these goals (GHSA, 2018). Pakistan has been a member of GHSA since 2015 and hence, recognises the significance of communicable diseases and the cross-sectoral challenges that communicable diseases present. However, the core capacities required to address these challenges and meet the targets set out in the GHSA 2024 Framework have not been fully developed at the national level and there is a lack of implementation (GOP, 2016b). There is a need to identify the gaps in Pakistan's capabilities to prevent, detect, assess and respond to communicable diseases and foster multi-sectoral engagement including health, law enforcement, trade, finance and labour in order to achieve sustainable results in terms of the prevention and control of communicable diseases.

WHO's Global Action Plan for the Prevention and Control of Non-Communicable Diseases 2013-20 provided Member States with a road map and variety of policy options to be implemented between 2013 and 2020, to achieve the 9 global non-communicable disease targets

by 2025 (WHO, 2013a). It is a guiding document that identifies priority policy and integrated action areas along with specific interventions that countries including Pakistan should focus on for this period in order to achieve national, regional and global targets regarding non-communicable diseases. It identifies four particular areas regarding non-communicable diseases; mortality and morbidity due to non-communicable diseases, behavioural risk factors of non-communicable diseases, biological risk factors of non-communicable diseases, and the national systems response to non-communicable diseases (WHO, 2013a, 2016).

According to WHO (2020), Pakistan has not achieved its national non-communicable diseases targets and indicators for 2025. This means that Pakistan has not set time-bound national targets based on WHO guidance, it does not have a functioning system for generating reliable cause-specific mortality data on a routine basis and it does not conduct a comprehensive health examination survey every five years (WHO, 2020). Similarly, Pakistan does not have an operational multi-sectoral national strategy or action plan that integrates the major non-communicable diseases and their shared risk factors (WHO, 2020). This is evident from the fact that 58% of the deaths in Pakistan are due to non-communicable diseases (WHO, 2020). Pakistan must integrate WHO's (2013a) Global Action Plan for the Prevention and Control of Non-Communicable Diseases into its health-planning processes and development plans and implement it in order to achieve its national non-communicable disease targets and indicators.

In 2007, WHO passed the Global Plan of Action on Workers' Health for 2008-2017 urging Member States, including Pakistan, to devise national policies and action plans to promote workers' health during the period 2008 to 2017 (WHO, 2013c). It provides a policy framework to encourage countries to protect, promote and improve the health of workers at the workplace including the prevention and control of communicable and non-communicable diseases,

employment conditions, access to occupational health services, improved health system responses to workers' health, incorporating workers' health into other policies and full health coverage of formal and informal workers. Pakistan does not have a policy framework or a national plan of action or even a dedicated ministry dedicated to worker's health. Due to the devolution of powers to the provinces after the 18th Amendment, Pakistan has separate provincial Departments for Labour and Health, but the Ministry of National Health Services Regulations and Coordination (MNHSRC) does not specifically address worker's health. Similarly, there is no central authority like a Ministry of Labour to protect workers' health. There should be a dedicated Ministry that coordinates the efforts of the relevant provincial departments and recognises that the right to health is a fundamental responsibility of the government. It must work with employers and key stakeholders in the health and labour sectors to tackle the impact of both kinds of diseases in Pakistan.

While Pakistan has up to date national plans and policies in line with global movements and action plans, there is a lack of coherence and implementation. Pakistan seems to be making some progress in this regard, but major challenges remain and need to be addressed by policymakers.

5.2.2 National Policies and Plans

Based on the global frameworks mentioned above, a number of national policies have been introduced in the past 10 years to effectively address the challenges faced by the health sector in Pakistan. These govern the institutions and processes involved in specifically addressing the control and prevention of communicable and non-communicable diseases in the country. These include the National Health Vision 2016-2025, the Action Plan 2019-2023, Public Health Laws in Pakistan, and Occupational Health and Safety Acts.

The MNHSRC developed the National Health Vision 2016-2025 document to provide a common strategic vision, aligned with the Pakistan Vision 2025, for the development of the health sector of the country and including strategic directions to achieve the national health vision (GOP, 2016b). The Vision recognises that Pakistan is facing a double burden of disease in terms of communicable diseases and non-communicable diseases. It is based on eight thematic pillars to ensure access, coverage, quality and safety in order to improve various aspects of the health system (GOP, 2016b).

The National Health Vision 2016-2025 recognises that the impact of communicable and non-communicable diseases is higher amongst the poor and that the high OOP expenditure faced by individuals can lead to uneven gains, lack of access to essential health services, reduced labour force participation, risk of catastrophic health expenditure, poverty and inequality (GOP, 2016b). For this purpose, the vision pledges to increase the allocation of budget to the health sector to 3% of the GDP and to focus on pro-poor social protection initiatives with an overall aim of achieving UHC (GOP, 2016b). While the current government seems to have initiated a pro-poor social protection initiative to decrease the OOP health expenditure of households, the current allocation of budget to the health sector stands at a mere 0.4% of the total budget expenditure in the fiscal year 2021 (GOP, 2020a). The National Health Vision 2016-25 pledges to adhere to international treaties and frameworks that would help achieve the targets regarding communicable and non-communicable diseases laid out in the SDGs, but there is no robust plan that includes targeted strategies in line with the SDGs, the GHSA, WHO's Global Action Plan for the Prevention and Control of Non-Communicable Diseases or WHO's Global Plan of Action on Workers' Health.

In November 2018, the MNHSRC developed an Action Plan 2019-2023 to provide a direction to overcome health challenges in the country and improve the health and well-being of the

population (GOP, 2018a). The plan is fully aligned with the SDGs and highlights the priorities over the period 2019 – 2023 for health sector reform. It was developed with a vision to improve the health status of the population by providing universal access to affordable and quality essential health services (GOP, 2018a). The Action Plan aimed to increase public health expenditure to 2% of the GDP in 2019 and to 5% of the GDP by 2023 (GOP, 2018a), whereas the National Health Vision 2016-25 pledges to increase the allocation of budget to the health sector to 3% of the GDP by 2025 (GOP, 2016b), depicting incoherence and overlapping of health policy targets. According to the plan, health insurance programmes were to be scaled up to all districts of Pakistan by 2020 to cover the poorest families against catastrophic health expenditure but the Sehat Sahulat Programme (SSP) initiated by the government does not cover two major provinces that account for more than 30% of the country's population (GOP, 2017).

The plan prioritises communicable diseases and non-communicable diseases as it recognises the double burden of disease in Pakistan and it includes specific indicators and milestones in line with indicators set under SDG 3 to help reduce the incidence of these diseases (GOP, 2018a). The four major communicable diseases (HIV, TB, malaria, hepatitis B) have been covered under the indicators given in the Action Plan. Non-communicable diseases have been covered in the indicators including cardiovascular diseases, cancer, diabetes and chronic respiratory diseases, drug and alcohol abuse, and suicide is covered under mental health. Although it is moderately improving, Pakistan has not achieved 2020's milestones set under the Action Plan and this could be because it lacks a detailed plan outlining interventions and resources needed to meet the milestones specified in the matrix. For example, the plan mentions that it aims to introduce sin taxes on harmful substances like cigarettes and sugary drinks and to involve the corporate sector to perform their corporate social responsibilities in tackling the burden of non-communicable

diseases (GOP, 2018a), but specific interventions should have been included to provide a direction to the relevant federal and provincial authorities for measurable success.

There are a number of public health laws in Pakistan that are relevant to the control and prevention of communicable and non-communicable diseases and the health of workers. Amongst a total of 196 public health laws, there are 104 preventive laws, 24 curative laws, 4 rehabilitative laws and 64 other laws (GOP, 2019a). About 154 laws play an important role in eliminating or reducing the incidence of communicable and non-communicable diseases directly and indirectly through the risk factors of non-communicable diseases (GOP, 2019a). However, the implementation of these laws remains weak.

Pakistan recognises that public health is closely linked to labour force participation through the Occupational Health and Safety Act passed in 2018. While the Act ensures safe and healthy working conditions for people at workplaces covering illnesses and diseases that can be attributed to occupational causes, its focus is mostly on occupational injuries. It does not seek to protect workers from specific communicable and non-communicable diseases. The Punjab Occupational Safety and Health Act 2019 provides particular guidelines on precautions against communicable diseases at workplaces through regular examination by a registered medical practitioner (GOP, 2019d). However, there is no provision for the protection of workers with communicable (or non-communicable) diseases. There is no such Act passed by any of the other provinces and the implementation of the rules and guidelines under these two Acts has been poor across public and private organisations in Pakistan. In fact, Pakistan does not have a dedicated Ministry or Department that protects, promotes and improves the health of workers at the workplace. Instead, many Ministries/Departments/Bodies exist but each has its own system and processes with no coordination.

In spite of these national policies that govern the aim to overcome health related problems in Pakistan, communicable and non-communicable diseases are still prevalent. While there are several national policy documents and road maps that outline the priority areas and are in line with international commitments, health reforms regarding communicable and non-communicable diseases have largely been undertaken piecemeal, without coherence between the visions, strategies and action plans. Comprehensive long-term goals, short-term goals, targets and interventions need to be clearly defined at the national and provincial levels and aligned with each other to ensure their continuity and sustainability, without duplicating efforts. In order to improve the progress made on health indicators regarding communicable and non-communicable diseases and their impact, it is important that the governance structure and policy framework of the health sector be streamlined. The government must develop multi-sectoral policies and strategies, including targeting the social determinants of health, and ensure their implementation.

5.3 Health Financing

Health financing is an important variable that affects the labour force participation of individuals with communicable or non-communicable diseases as illness can be a huge financial burden on individuals or households through high OOP expenditure and may increase participation in the labour force due to the income effect. Individuals who have communicable diseases and continue to or increase participation in the labour force not only pose health threats to others at work but also increase the risk of morbidity and mortality. It is therefore imperative to understand the current state of health expenditure, universal health coverage and the presence of health insurance programmes in Pakistan to understand how these can affect labour force participation.

Based on the questionnaire filled out by Ms. Gul Rukh Mehboob, Technical Advisor for Social Health Protection at a renowned international agency, the health financing component has been

classified as Emerging with an average score of 3.5 as shown in Table 5.2. This indicates that a health financing system exists with health insurance schemes and a strategy to reduce OOP health expenditure in place but there is a still a lack of universal health coverage, low utilisation of the SSP and a lack of coordination between federal and provincial bodies and schemes.

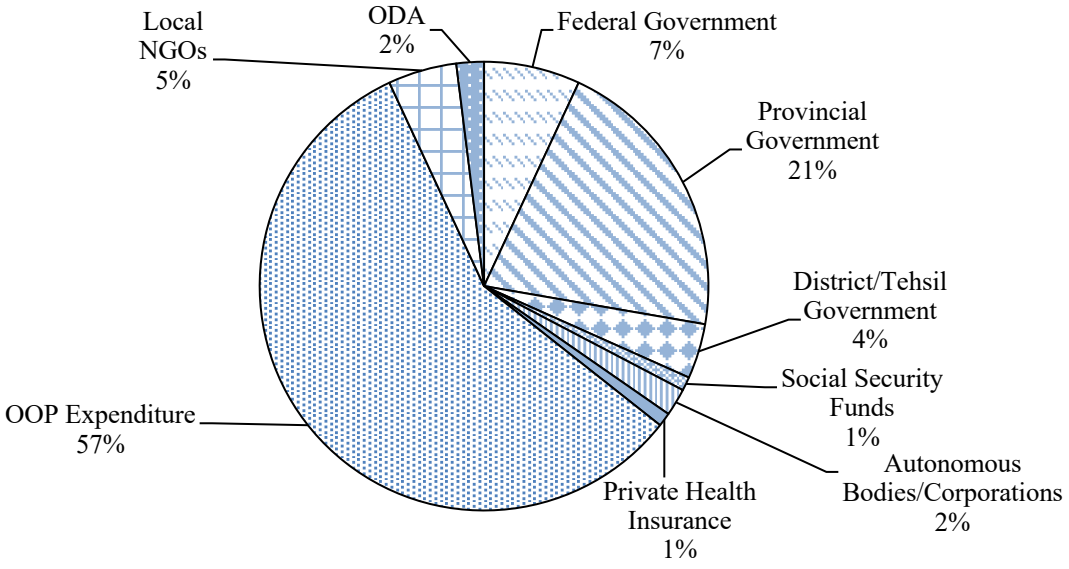
Table 5.2: Scoring Matrix for Health Financing

Key Building Block	Sub-component	No. of questions	Score	Scoring				
				Latent (1)	Nascent (2)	Emerging (3)	Established (4)	Advanced (5)
Health Financing	Health Expenditure in Pakistan	1	3.5				4	
	Universal Health Coverage in Pakistan	1					4	
	Sehat Sahulat Programme	4				3		
	Provincial Employees Social Security Ordinance	1				3		

5.3.1 Health Expenditure in Pakistan

The total health expenditure in Pakistan in the fiscal year 2015-16 was estimated at PKR 908 billion (GOP, 2018c). There are three major sources for health financing in Pakistan: public funds, private funds mainly through OOP expenditure by individuals and Official Donor Agencies (ODA) (GOP, 2018c). The share of public funds is 33.9%, the share of private funds is 64.4% out of which 89% is OOP health expenditures by private households and the share of ODA is 1.7% (GOP, 2018c). The disaggregation of total health expenditure by financing agent is given in Figure 5.2 below.

Figure 5.2: Total Health Expenditure by Financing Agent (% Distribution)
Source: National Health Accounts 2015-16



It is important to note that the total public health expenditure as a percentage of GDP was 0.9% in 2015-16 and increased to only 1.1% in 2018-19 (GOP, 2020b). The low health expenditure means that the share of health expenditure per person is only US Dollars (USD) 45 per person per year (GOP, 2018c), which is insufficient to achieve the level of health outcomes committed in our national policies and global agendas and is among the lowest in South Asia. It is estimated that the share of public health expenditure per person per year must be USD 271 (GOP, 2018a). This has implications on the high level of OOP expenditure by individuals when they contract a communicable or non-communicable disease where OOP payments are defined as the direct payments made by individuals for health services from their income or savings (GOP, 2018c). Punjab has the highest share (54%) of OOP health expenditure followed by Sindh (24%), KPK (16%) and Balochistan with the least share of 5% of OOP health expenditure (GOP, 2018c).

In Pakistan, catastrophic health expenditures are responsible for 54% of the economic shocks faced by low-income households (Shaikh et al., 2019). Given that having a communicable disease increases the likelihood of participating in the labour force through the income effect, there is a need to examine the policies aimed at reducing the high level of OOP expenditure by individuals. Although the income effect does not seem to take place when individuals have non-communicable diseases as the results in Chapter 4 show that having a non-communicable disease decreases the likelihood of participating in the labour force, the income effect may set in in the long run, where the continuously high level of OOP expenditure may escalate the possibility of people being in the labour force to cover their medical costs.

Investing in communicable and non-communicable diseases through higher public health expenditure directly influences individuals' decisions regarding participating in the labour force due to lower OOP expenditure and hence, a lower income effect. It also influences individuals' decisions regarding food, lifestyle, media, etc. that have an effect on the health status of an individual (WHO, 2013a). Therefore, the government must improve budgetary allocation for the health sector, and strengthen the health insurance system and the response to communicable and non-communicable diseases. UHC needs to be established at the country level in order to support the sustainable prevention and control of communicable and non-communicable diseases.

5.3.2 Universal Health Coverage in Pakistan

UHC means that people should have equitable access to curative, preventive, promotive and rehabilitative basic health services without exposing them to financial hardship (WHO, 2013a). UHC particularly focuses on providing financial health coverage to marginalised communities. Ensuring an adequate level of public financing is allocated to the health sector is essential in order to achieve UHC (WHO, 2016). As UHC has become a widely accepted idea and also one

of the indicators under SDG 3, many countries are increasing their level of public financing allocated to the health sector and introducing health insurance programmes that specifically target the poor including the Social Health Insurance in Vietnam, Rashtriya Swasthiya Bima Yogna in India and Health Coverage Programme in the Philippines (Durr-e-Nayab & Khan, 2015). However, Pakistan lags far behind in achieving this goal. Over the years, the government has made limited efforts to ensure UHC for the population of Pakistan. One such initiative was the Waseela-e-Sehat Scheme under the BISP launched by the government in 2012 to protect vulnerable families from the high level of OOP health expenditure and potential loss of income due to catastrophic health shocks by providing health insurance (Durr-e-Nayab & Khan, 2015). However, due to operational challenges and overlapping mandates with other federal and provincial schemes, the scheme was shut down in 2016.

There are other social protection initiatives like Zakat and Bait-ul-Mal that may contribute to achieving UHC in Pakistan but these are not health insurance programmes per se and contribute a very low percentage to achieving UHC in Pakistan. In order to be eligible for Zakat, an individual must be a Muslim living below the poverty line. The individual must follow an entire process and if successful, financial assistance received by the individual can be used for transportation, medicines, medical treatment and tests. Similarly, poor individuals with a monthly income of PKR 17,500 or less are eligible for Individual Financial Assistance under the Pakistan Bait-ul-Mal system, in which individuals can receive medical treatment but only twice in their entire life (GOP, 2019b). While the Zakat and Bait-ul-Mal systems contribute to achieving UHC for the poor, these systems have remained largely unsuccessful due to limited level of coordination with the relevant government bodies.

5.3.3 Sehat Sahulat Programme

The SSP is a social health insurance programme that provides financial health coverage to marginalised communities and protects them from catastrophic health care expenditure while providing quality health care services across the country (GOP, 2021b). The SSP currently covers all districts of KPK, Punjab, Gilgit Baltistan (GB), and Azad Jammu and Kashmir (AJK) for all people living below the poverty line i.e. who earn less than USD 2 per day (GOP, 2021c). Coverage is also being provided to the entire population of the Newly Merged Districts of KPK and the district Tharparker in Sindh, to persons with disabilities in Islamabad Capital Territory, Punjab, GB and AJK, and to the transgender community across Pakistan (GOP, 2021c). Households who meet the criteria are enrolled into the programme and provided with health cards known as the Sehat Insaf Plus Card in KPK and the Qaumi Sehat Card or Sehat Insaf Card in the rest of the country. Under the SSP, the federal government and the Government of Punjab are providing health insurance to more than 10 million families while the Government of KPK is providing health insurance to more than 6 million families (GOP, 2021b).

The current benefit package under the SSP includes first level and tertiary level health care services for in-patient or hospitalisation services only. The priority and secondary disease treatment packages offer coverage for most communicable diseases like TB, HIV, typhoid, hepatitis and COVID-19, and non-communicable diseases including heart diseases, diabetes, burns, accidents, injuries, kidney diseases, cancer, neuro-surgical illnesses, pancreatitis, seizures and maternity services (GOP, 2021a). Through these packages, the SSP relieves the burden of OOP expenditure for individuals with most communicable and non-communicable diseases and who are availing medical care in public and private hospitals. On paper, this seems like an elaborate government-administered programme designed to provide quality health care services

and reduce the OOP health expenditure of individuals. However, most public hospitals empanelled under the SSP provide low-quality health services and are unable to cope with the overload of patients due to several shortcomings like inadequately trained staff (Government of UK, 2020). As a result, a lot of people will have to rely on private health care. Studies indicate that around 75% of the population relies on private health care because of low quality health services provided by public hospitals (Government of UK, 2020). While the empanelment of private hospitals under the SSP will allow people to seek medical care in private hospitals, the relatively higher costs of private medical care as compared to public medical care means that individuals may be able to avail less services than they would if they could seek quality medical care in a public hospital, raising their OOP health expenditure. An individual from a low-income household can be pushed below the poverty line due to catastrophic health expenditure as the individual seeks medical treatment from a high-quality private hospital. In order to avoid this, individuals from low-income households may continue to participate in the labour force to earn an income and seek medical treatment. Hence, health insurance programmes like the SSP need to ensure that the empanelled medical health facilities are providing quality health services.

Despite high levels of enrolment into the SSP, the success of the programme cannot be solely determined by the rate of enrollment as utilisation has been low. A study analysing utilisation and the factors affecting utilisation of a micro health insurance programme provided to poor households in Sindh found that households that successfully utilised the scheme were protected from catastrophic health expenditures but the overall utilisation was very low at only 0.42% and a major factor that determined the utilisation was a lack of awareness regarding the scheme (Cheema et al., 2020). This indicates that it is important to create awareness about the SSP amongst the population and how it can protect them from high levels of OOP health expenditure.

Several studies find that another factor that can prevent people from utilising the SSP is the distance to the hospitals empanelled under the scheme (Iqbal et al., 2017; Kusuma et al., 2018). The opportunity cost of travelling to an empanelled public (or private) hospital can be high in cases where the average distance to the nearest medical facility is high. This can come at the cost of an individual's income due to the additional expense of hired transport. Hence, individuals may find it more cost-effective to go to a medical facility that is nearby even though it may not be empanelled under the SSP and pay out of their pocket. Several challenges remain in the SSP but the progress being made is insufficient to attain the goal of UHC in Pakistan.

5.3.4 Provincial Employees Social Security Ordinance

In working towards UHC, it is important to provide workers with access to quality health services, while ensuring protection against high OOP health expenditures and resulting financial hardship (WHO, 2013b). Countries like Indonesia and Sri Lanka are becoming concerned about the effect of illness on labour force participation in terms of productivity, sickness absenteeism and social security. As a result, they have started integrating interventions for the protection of workers' health into their primary care services covered under their UHC schemes.

In Pakistan, the Provincial Employees Social Security Ordinance was passed in 1965 to provide a social security scheme where benefits are given to employees if they fall sick, in cases of maternity, or in case the employee is harmed or dies (GOP, 1965). As per the Ordinance, employees will receive sickness benefits. For example, a worker is entitled to receive sickness benefit for 365 days of an illness in case the individual has a communicable disease like TB or a non-communicable disease like cancer (GOP, 1965). For any other disease, the worker will be entitled to receive a sickness benefit for 121 days upon certain conditions (GOP, 1965). Similarly, an individual is entitled to injury benefits and medical care including general

practitioner care, in-patient and out-patient care, essential pharmaceutical supplies and hospitalisation subject to certain conditions (GOP, 1965).

This is the first and only labour welfare law introduced in Pakistan with the intention of providing health coverage to employees in the lower-income group. However, the scheme only applies to those industries or establishments, and from such date, as the respective provincial governments may specify through a notification, depriving employees in most public and private organisations in the country from medical coverage provided under the scheme. Furthermore, 72% of the non-agricultural labour force is employed in the informal sector in Pakistan (GOP, 2018b) and they do not have any health insurance to compensate them for the high OOP health expenditure if they contract a communicable or non-communicable disease. They have no social protection for seeking health care such as health insurance, sick pay or sick leave, all of which can reduce the high OOP health expenditure and affect their probability of participating in the labour force (Wolf et al., 2018). Other schemes providing health coverage to workers that do exist have overlapping mandates and lack coherence.

5.4 Programmes Targeted at Communicable and Non-Communicable Diseases

Effectively tackling communicable and non-communicable diseases and their impact on labour force participation requires a thorough understanding of the current programmes and interventions at the country level. It also serves to highlight challenges, gaps and areas that require further attention by the government. Based on the questionnaire filled out by Dr. Sara Shahzad, a health expert at a renowned international agency, the component on programmes targeted at communicable and non-communicable diseases has been classified as Nascent with an average score of 2.3 as shown in Table 5.3. This indicates that there is ad hoc programming and policy measures with no coordination between federal and provincial bodies. This sub-

section provides an overview of the programmes targeted at communicable and non-communicable diseases and their implementation at the national level.

Table 5.3: Scoring Matrix for Programmes Targeted at Communicable and Non-Communicable Diseases

Key Building Block	Sub-component	No. of questions	Score	Scoring				
				Latent (1)	Nascent (2)	Emerging (3)	Established (4)	Advanced (5)
Programmes Targeted at Communicable and Non-Communicable Diseases	Programmes Targeted at Communicable Diseases	3	2.335		2.67			
	Programmes Targeted at Non-Communicable Diseases	4			2			

5.4.1 Programmes Targeted at Communicable Diseases

Pakistan has been committed to improving the incidence of communicable diseases amongst the population as it is one of the few countries that still bear the burden of many communicable diseases like HIV/AIDS, TB and polio. While Pakistan has been moving in the right direction in maintaining SDG achievement regarding communicable diseases like HIV infections, there is a need to integrate communicable disease programmes within the broader health system in order to eliminate vaccine-preventable diseases like TB from the country altogether. Table 5.4 below gives an overview of the programmes targeted at communicable diseases in Pakistan. There are several vertical programmes that exist for most communicable diseases but there is limited level of coordination between federal and provincial bodies.

Table 5.4: Programmes Targeted at Communicable Diseases in Pakistan

Programme	Description
National Tuberculosis Control Programme	The National TB Control Programme provides free diagnostic and treatment services to TB patients through a network of 1400 TB care facilities across the country (Government of UK, 2020).
Malaria Control Program under the Directorate of Malaria Control	The Malaria Control Program provides malaria preventive and treatment services through 3,818 fully functional public and private diagnostic centres in 72 districts across the country (GOP, 2019c).
National AIDS Control Programme	The National AIDS Control Programme works on the prevention of HIV and Sexually Transmitted Diseases transmission, supply of safe blood for transfusions, free treatment of HIV and Sexually Transmitted Infections, and Behaviour Change Communication (National Institute of Health, 2021).
Prime Minister's Hepatitis Prevention and Control Programme	No national programme currently exists. Separate interventions to eliminate hepatitis B and C infections from the country work through various organisations (Government of UK, 2020).
Pakistan Polio Eradication Programme	The Pakistan Polio Eradication Programme focuses on eradicating the polio virus from Pakistan. It aims to reach every child with vaccines and strengthen surveillance, driven by up to 260,000 polio vaccinators (National Emergency Operations Centre, 2021).
Expanded Programme on Immunisation	The Expanded Programme on Immunisation provides safe and effective vaccination against communicable diseases. It protects children by immunising them against TB, poliomyelitis, diphtheria, pertussis, tetanus, hepatitis B, Hib pneumonia and meningitis, measles and diarrhoea due to rotavirus (WHO, 2021b).

Communicable diseases can spread through employees in the workplace if individuals continue to work after contracting the disease. Employees without symptoms may not even realise that they have contracted the disease and they may continue to work if they do not get paid time off. Currently, some programmes/policies have been introduced by some organisations but with limited level of coordination with the government. Labour Departments, in coordination with

MNHSRC, must systematically address communicable diseases that not only affect employees' health but also impact productivity, business operations and labour force participation. Educating and sharing information with employees on the transmission and prevention measures can help employers control communicable diseases in the workplace (Zurich Services Corporation, 2007). Employers should also introduce screening and vaccination programmes at the workplace (Zurich Services Corporation, 2007) to prevent and control communicable diseases while reducing their impact on labour force participation.

5.4.2 Programmes Targeted at Non-Communicable Diseases

While public health programmes in Pakistan have mostly focused on the prevention and control of communicable diseases, non-communicable diseases are increasingly contributing to adult mortality and morbidity in Pakistan (WHO, 2018). The four major types of non-communicable diseases include cardiovascular diseases, diabetes, chronic respiratory diseases and cancers, and share key modifiable behavioural risk factors like harmful use of alcohol, physical inactivity, unhealthy diets and tobacco use (WHO, 2020). There are certain disaggregated efforts by various international non-governmental organisations (INGOs) and non-governmental organisations (NGOs) in Pakistan, but there are no vertical programmes aimed at the early detection and management of non-communicable diseases as such. Although interventions aimed at addressing certain risk factors are moving in the right direction (use of tobacco and alcohol), the implementation of prevention or reduction measures for other risk factors are too slow to achieve the national targets. The type of diseases, the current prevention/reduction measures and the status of these is given in Table 5.5.

The exposure of individuals to behavioural risk factors for non-communicable diseases is largely determined by policies in the labour, tax, trade, education, urban planning and other non-health

Table 5.5: Programmes Targeted at Non-Communicable Diseases in Pakistan

Non-Communicable Disease	**Prevention/Reduction Measures**	**Status**
Type of Disease		
Cardiovascular disease	Programme for treatment and control of cardiovascular diseases	Yet to achieve
	Drug therapy/counselling to prevent heart attacks	Not achieved
	Guidelines for management of cardiovascular diseases	Not achieved
Cancer	Programme for treatment and control of cancer	Yet to achieve
	Guidelines for management of cancer	Not achieved
Chronic respiratory diseases	Programme for treatment and control of chronic respiratory diseases	Yet to achieve
	Guidelines for management of chronic respiratory diseases	Not achieved
Diabetes	Programme for treatment and control of diabetes	Yet to achieve
	Guidelines to manage diabetes	Yet to achieve
Risk Factors		
Harmful use of alcohol	Restrictions on physical availability	Fully achieved
	Bans or restrictions on advertisements	Partially achieved
	Increased excise taxation	Fully achieved
Physical inactivity	Educate and conduct awareness campaigns	Yet to achieve
Unhealthy diet	Policies regarding salt intake	Not achieved
	Awareness on restrictions for children	Yet to achieve
	Marketing of substitutes for breast-milk	Fully achieved
Tobacco use/smoking	Increased excise taxation	Partially achieved
	Policies on going smoke free	Fully achieved
	Warnings of health issues through graphics	Fully achieved
	Bans on advertising, sponsoring and promoting	Partially achieved
	Mass media campaigns	Fully achieved

Source: World Health Organization (2020)

sectors (WHO & UNDP, 2016). Thus, non-communicable diseases and their impact are preventable through better policy coherence across sectors at the federal and provincial levels. The government must introduce smart policy and regulatory measures to create a healthier environment for the population like reducing the consumption of excessive sugar and salt and taxing health-harming products in the tobacco, alcohol and beverages industry adequately.

There are no such programmes that address the early prevention, detection and management of non-communicable diseases for workers in the workplace. The Labour Departments in Pakistan must ensure that employees in public and private organisations are informed and aware of the harmful effects of tobacco, alcohol, beverages and unhealthy diets. Tobacco use or smoking should be banned on work premises and organisations should ensure that the ban is enforced. Employers should also provide employees with tobacco cessation services (WHO & UNDP, 2016). Employers should also ensure that healthy food items and beverages are made available for consumption on the work premises. Physical activity should also be promoted at work through workplace wellness programs including adjusting work processes to increase physical activity or offering gym membership services and yoga classes (WHO & UNDP, 2016).

Adopting these policies and raising public awareness about the risk factors of non-communicable diseases will result in people making healthier choices and healthier people are more likely to participate in the labour force and be economically productive (WHO, 2018). This must be accompanied by national programmes aimed at early detection and management of non-communicable diseases in the country.

5.5 Conclusion

Based on the questionnaires filled out by health experts for all three components, the overall policy landscape regarding communicable and non-communicable diseases in Pakistan has been

classified as Nascent with an average score of 2.98 as shown in Table 5.6. This indicates that it is almost within the Emerging category but the progress is insufficient to achieve the goals set out in the global and national plans. There is much room for improvement before Pakistan can be classified as Advanced and considerably reduce the incidence of communicable and non-communicable diseases as well as their impact on labour force participation in Pakistan.

Table 5.6: Scoring Assessment Matrix for Policy Landscape Targeted at Communicable and Non-Communicable Diseases in Pakistan

Key Building Block	Sub-component	No. of questions	Score	Scoring				
				Latent (1)	Nascent (2)	Emerging (3)	Established (4)	Advanced (5)
Governance and Policy Frameworks	Global Visions and Plans	5	3.1		2.8			
	National Policies and Plans	5				3.4		
Health Financing	Health Expenditure in Pakistan	1	3.5				4	
	Universal Health Coverage in Pakistan	1					4	
	Sehat Sahulat Programme	4				3		
	Provincial Employees Social Security Ordinance	1				3		
Programmes Targeted at Communicable and Non-Communicable Diseases	Programmes Targeted at Communicable Diseases	3	2.335		2.67			
	Programmes Targeted at Non-Communicable Diseases	4			2			
SUM				3.1 + 3.5 + 2.335 = 8.935				
Average Score				8.935/3 = 2.98				
Equivalent Level				Nascent				

CHAPTER 6

CONCLUSION AND POLICY IMPLICATIONS

Poor health has substantial consequences on labour force participation, as health is a major determinant of productivity, income, hours worked, absenteeism and early retirement. The double burden of communicable and non-communicable diseases imposes severe consequences on individuals' labour force participation. Hence, this study explores the impact of health on labour participation and existing policy landscape so that policymakers can design policies that are effective in reducing the incidence and consequences of communicable and non-communicable diseases.

6.1 Conclusion

The results of the multivariate analysis of the impact of illness on labour force participation showed that there is a significant relationship between illness and labour force participation. In particular, there is a negative relationship between disease and labour force participation, where having a disease decreases the likelihood of participating in the labour force by about 6 percentage points. Individuals with any of the two diseases are less probable relative to people who do not have diseases from being part of the labour force, but the effect of non-communicable diseases is stronger. Specifically, having a communicable disease decreases the likelihood of participating in the labour force by about 4 percentage points while having a non-communicable disease decreases the likelihood of participating in the labour force by about 8 percentage points compared to those who do not have diseases. A comparison of the impact of communicable and non-communicable disease on the labour market showed that there is a

positive association concerning communicable disease and labour force participation but a negative association concerning non-communicable disease and labour force participation.

On one hand, having a communicable disease increases the probability of being part of the labour force by 5 percentage points when compared with non-communicable disease, which has been explained by the income effect. According to the income effect, poor health can lead to a decline in productivity and hence, a lower income (Becker, 1962; Leibenstein, 1957; Mushkin, 1962; Schultz, 1961), which could further lead to an increase in labour supply in order to make up for the lower income (Cai & Kalb, 2006). The income effect also implies that individuals with communicable diseases will increase labour force participation in order to meet the higher health expenditure due to an increase in demand for health care services (Cai & Kalb, 2006; Dwyer & Mitchell, 1999). On the other hand, having a non-communicable disease decreases the possibility of people being in the labour market force by 5 percentage points when compared with communicable disease, which is in line with conventional theories on productivity and labour-leisure choice or the substitution effect. Non-communicable diseases can reduce workers' productivity (Bloom et al., 2020; Jäckle & Himmler, 2010) due to the nature of the disease, resulting in individuals either exiting from the labour force altogether or reducing the number of hours spent participating in the labour force by taking recurrent sick leave or long-term absence from work (OECD, 2016). The reduced income resulting from lower productivity can also lower the value of time spent at work. This influences individuals' preferences from work towards leisure so that they can take care of their health or so that they can spend more time on leisure activities.

This study also examined the indirect impact of both kinds of diseases on labour force participation via socio-demographic variables like age, age squared, gender, region, transfers

received by the household, highest level of education and province. The results indicate that there is a significant relationship between age, age squared, gender, region, transfers received by the household, highest level of education, province and labour force participation. However, the results uncover insignificant effects of marital status, other levels of education and the province of Balochistan on labour force participation. The determinants that have been identified based on the results play an important role in policy formulation regarding the impact of illness on labour force participation but there are significant policy implications of the direct impact of both kinds of diseases on labour force participation. The overall policy landscape regarding communicable and non-communicable diseases in Pakistan is still in its nascent stage as progress is insufficient in reducing the incidence of communicable and non-communicable diseases and their impact on labour force participation in Pakistan.

6.2 Policy Implications

The economic impact of health in general, and of communicable and non-communicable diseases in particular, is of interest and relevance to policymakers. Three key building blocks with multiple sub-components have been identified and anaylsed to provide a holistic view of the ecosystem surrounding both diseases and their impact on labour force participation. These include governance and policy frameworks for communicable and non-communicable diseases, health financing and programmes targeted at communicable and non-communicable diseases. The policy analysis includes a questionnaire conducted with three key experts in the health sector of Pakistan and an assessment matrix classifying the overall system as latent, nascent, emerging, established or advanced and summarising the state of development of Pakistan's public health system from a policy perspective. This is followed by a review of global and national policies, research articles and evaluation reports to provide further detail on the existing policy landscape

that targets communicable and non-communicable diseases and their direct impact on labour force participation in Pakistan.

Governments can achieve real improvements in the health status of the population, thereby improving labour force participation, by adopting a multi-sectoral approach including the influence of public policy in sectors such as health, finance, taxation, labour, environment, education and social protection (WHO, 2016). There are several institutional frameworks that promote a multi-sectoral policy approach and the policy analysis conducted in light of the results of this study lead to the following policy recommendations that policymakers should adopt.

Governance and Policy Frameworks:

- Devise national policies and action plans to promote workers' health and develop a dedicated ministry dedicated to worker's health. The dedicated Ministry should coordinate the efforts of the relevant provincial departments and recognise that the right to health is a fundamental responsibility of the government.
- Ensure implementation of national policies and plans and improving accountability will provide direction and opportunities to the government to reduce the incidence of communicable and non-communicable diseases, which has a direct impact on labour force participation and the economy.
- The government must ensure that the appropriate institutional and legal systems are in place to reduce the incidence of both diseases and their impact on labour force participation.

Health Financing:

- Increase the allocation of budget to the health sector to 5% of the GDP and increasing public expenditure on communicable and non-communicable diseases in particular.
- Increase the share of public funds in particular so that the share of public health expenditure per person per year must be at least USD 271 as per WHO guidelines, thereby reducing the high level of OOP expenditure by individuals when they contract a communicable or non-communicable disease.
- The SSP must be strengthened by covering the rest of the population of the country and ensuring that the empanelled medical health facilities are providing quality health services so that people do not have to rely on private health care that increases their OOP expenditure. In particular, it should be ensured that people living in rural areas have access to appropriate medical care and insurance programmes that reduce OOP expenditure, thereby preventing their withdrawal from the labour force when they fall ill.
- Provide employees with sickness benefits, injury benefits and medical care including general practitioner care, in-patient and out-patient care, essential pharmaceutical supplies and hospitalisation as well as social protection for seeking health care such as health insurance, sick pay or sick leave, all of which can reduce the high OOP health expenditure and affect their probability of participating in the labour force.

Programmes targeted at communicable and non-communicable diseases:

- Strengthen programmes for the prevention and control of communicable and non-communicable diseases. This requires monitoring the trends and determinants of communicable and non-communicable diseases, evaluating progress against global and

national targets, and strengthening the health care system so that it addresses the prevention, early detection and treatment of communicable and non-communicable diseases.

- Improving multi-sectoral coordination between various health and non-health sectors such as labour, tax, trade, education and urban planning to ensure that awareness regarding the spread of communicable diseases and the exposure of individuals to modifiable risk factors for non-communicable diseases are factored into policies and plans at the national and local levels.
- Educate and share information with employees on the transmission and prevention measures can help employers control communicable diseases in the workplace. Employers should also introduce screening and vaccination programmes at the workplace to prevent and control communicable diseases while reducing their impact on labour force participation.
- The government must introduce smart policy and regulatory measures to create a healthier environment for the population like reducing the consumption of excessive sugar and salt and taxing health-harming products in the tobacco, alcohol and beverages industry adequately.
- The Labour Departments in Pakistan must ensure that employees in public and private organisations are informed and aware of the harmful effects of tobacco, alcohol, beverages and unhealthy diets. Tobacco use or smoking should be banned on work premises, organisations should ensure that the ban is enforced and employers should also provide employees with tobacco cessation services.

- Employers should ensure that healthy food items and beverages are made available for consumption on the work premises. Physical activity should also be promoted at work through workplace wellness programs including adjusting work processes to increase physical activity or offering gym membership services and yoga classes.

6.3 Future Research

The evidence in this study suggests that both types of diseases have a significant impact on labour force participation. While this model includes gender as one of the independent variables, future research can estimate the differences in the impact of diseases on labour force participation via gender by using male and female samples. This is important as the impact of health on labour force participation can differ between men and women (Gambin, 2005). It will make it easy to make generalisations about gender differences and this information can be used to target communicable and non-communicable diseases in programmes or interventions by gender.

In public health, most research addresses communicable and non-communicable diseases in separate silos. Despite evidence of the dangerous convergence between communicable and non-communicable diseases, our health systems lack effective prevention and treatment programmes that consider the fact that communicable diseases are related to non-communicable diseases (National Academies of Sciences Engineering Medicine, 2019). As the world is faced with the COVID-19 pandemic, the most devastating communicable disease outbreak in decades, the crisis has revealed a great deal about the potentially harmful interlinkages between the two diseases as people with non-communicable diseases are at higher risk and far more likely to be affected by COVID-19. The pandemic has also revealed that communicable diseases can have a severe

impact on the economy in general and on labour force participation in particular, and about the existing gaps in our economic and health systems. Future research should take account of the interlinkages between communicable and non-communicable diseases by measuring the joint impact on labour force participation and its policy implications.

While there are various policies and programmes in place that target communicable and non-communicable diseases and their direct or direct impact on labour force participation, there is a need for periodic evaluation studies to gauge the effectiveness of these programmes. Timely collection of data against indicators and a systematic investigation of the quality, effectiveness and costs of programmes can help drive improvement through analysis and dissemination of the findings can maximise learning in this field (University of California, 2013). A thorough assessment of these programmes in future research can also help establish whether these programmes are worthy of investment, whether these policies and programmes are viable and sustainable, and what improvements need to be made to help reduce the incidence of communicable and non-communicable diseases and their impact on labour force participation.

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Appendices

Appendix A

Appendix A presents three sets of results separately for three models that have been used to assess the impact of illness on labour force participation: the impact of disease on labour force participation, the impact of communicable and non-communicable diseases on labour force participation, and a comparison of the impact of communicable and non-communicable diseases on labour force participation. It provides all sets of results for all three models including the probit estimates, 2SRI estimates controlling for endogeneity of the health status variable and control function approach estimates controlling for both endogeneity of the health status variable and unobserved heterogeneity.

Table 1: Estimates of the Impact of Disease on Labour Force Participation

Variables	Probit (Marginal Effects)	Two Stage-Residual Inclusion	Control Function Approach	95% Confidence Interval (Probit-Marginal Effects)	
Disease (disease = 1)	-0.0624*** (0.0120)	3.9970*** (0.5584)	4.7659*** (1.1221)	-0.0858	-0.0390
Disease residual		-4.1719*** (0.5593)	-4.1490*** (0.5601)		
Interaction of disease and disease residual			-0.8611*** (1.0815)		
Socio-demographic characteristics					
Age	0.0667*** (0.0014)	0.1693*** (0.0036)	0.1693*** (0.0036)	0.0640	0.0694
Age squared	-0.0008*** (0.00002)	-0.0021*** (0.00005)	-0.0021*** (0.00005)	-0.0008	-0.0008
Gender (male = 1)	0.6046*** (0.0049)	1.8198*** (0.0221)	1.8201*** (0.0221)	0.5951	0.6141
Marital status (married = 1)	0.0732*** (0.0090)	0.1264*** (0.0248)	0.1267*** (0.0248)	0.0555	0.0909
Rural area (rural = 1)	0.1490*** (0.0062)	0.4153*** (0.0171)	0.4155*** (0.01721)	0.1368	0.1611
Transfers (transfers received =1)	0.0932*** (0.0103)	0.2973*** (0.0273)	0.2977*** (0.0273)	0.0731	0.1133
Education (No formal education is the reference category)					
Primary	0.1020*** (0.0095)	0.2317*** (0.0241)	0.2316*** (0.0241)	0.0835	0.1206
Secondary	0.0946*** (0.0110)	0.2651*** (0.0279)	0.2652*** (0.0279)	0.0730	0.1163
Matric/O-Level	0.0496*** (0.0101)	0.1381*** (0.0256)	0.1382*** (0.0256)	0.0298	0.0699

Intermediate	0.0423*** (0.0141)	0.1421*** (0.0358)	0.1421*** (0.0358)	0.0148	0.0699
Degree and above	0.1390*** (0.0153)	0.3603*** (0.0387)	0.3606*** (0.0387)	0.1091	0.1689
Other education	0.1508*** (0.0476)	0.3875*** (0.1224)	0.3868*** (0.1224)	0.0574	0.2441
Province (Punjab is the reference province)					
Khyber Pakhtunkhwa	-0.1244*** (0.0076)	-0.3851*** (0.0220)	-0.3855*** (0.0220)	-0.1392	-0.1095
Sindh	0.0818*** (0.0079)	0.0299*** (0.0316)	0.0284*** (0.0316)	0.0663	0.0973
Balochistan	-0.0465*** (0.0095)	-0.1567*** (0.0254)	-0.1571*** (0.0254)	-0.0652	-0.0279
Number of observations	42125	42125	42125		
Wald χ^2	10806.70	10870.96	10871.93		
Pseudo R^2	0.3812	0.3821	0.3821		

Robust standard errors in brackets
***, **, *: significant at 1%, 5% and 10% respectively

Table 2: Estimates of the Impact of Communicable and Non-Communicable Disease on Labour Force Participation

Variables	Probit (Marginal Effects)	Two Stage-Residual Inclusion	Control Function Approach	95% Confidence Interval (Probit-Marginal Effects)	
Disease (No disease is the reference category)					
Communicable disease	-0.0366** (0.0174)	6.8617* (2.6508)	7.0119** (3.7053)	-0.0706	-0.0025
Non-communicable disease	-0.0840*** (0.0159)	1.5579 (2.4330)	1.2518 (3.4381)	-0.1153	-0.0528
Communicable disease residual		-6.9688*** (2.6510)	-6.9714* (2.6515)		
Interaction of communicable disease and communicable disease residual			-0.1537 (2.7300)		
Non-communicable disease residual		-1.7918*** (2.4334)	-1.7937 (2.4334)		
Interaction of non-communicable disease and non-communicable disease residual			0.3248 (2.5749)		
Socio-demographic characteristics					
Age	0.0667*** (0.0014)	0.1701*** (0.0038)	0.1701*** (0.0038)	0.0639	0.0694
Age squared	-0.0008*** (0.00002)	-0.0021*** (0.00005)	-0.0021*** (0.00005)	-0.0008	-0.0007
Gender (male = 1)	0.6042*** (0.0049)	1.7619*** (0.0604)	1.7618*** (0.0604)	0.5947	0.6138
Marital status (married = 1)	0.0736*** (0.0090)	0.1661*** (0.0457)	0.1660*** (0.0457)	0.0559	0.0913
Rural area (rural = 1)	0.1489*** (0.0062)	0.4129*** (0.0174)	0.4128*** (0.0174)	0.1368	0.1611
Transfers (transfers received	0.0934***		0.3096***	0.0733	0.1135

=1)	(0.0103)		(0.0290)		
Education (No formal education is the reference category)					
Primary	0.1022*** (0.0095)	0.2533*** (0.0319)	0.2533*** (0.0319)	0.0837	0.1208
Secondary	0.0947*** (0.0110)	0.2795*** (0.0309)	0.2795*** (0.0309)	0.0731	0.1163
Matric/O-Level	0.0497*** (0.0101)	0.1576*** (0.0314)	0.1577*** (0.0314)	0.0299	0.0696
Intermediate	0.0428*** (0.0141)	0.1864*** (0.0541)	0.1864*** (0.0541)	0.0152	0.0703
Degree and above	0.1394*** (0.0153)	0.3970*** (0.0514)	0.3970*** (0.0514)	0.1095	0.1694
Other education	0.1504*** (0.0477)	0.3601*** (0.1252)	0.3600*** (0.1252)	0.0570	0.2438
Province (Punjab is the reference province)					
Khyber Pakhtunkhwa	-0.1243*** (0.0076)	-0.3762*** (0.0240)	-0.3760*** (0.0241)	-0.1391	-0.1095
Sindh	0.0811*** (0.0079)	-0.0490 (0.0766)	-0.0492 (0.0766)	0.0656	0.0966
Balochistan	-0.0464*** (0.0095)	-0.1326*** (0.0345)	-0.1325*** (0.0345)	-0.0650	-0.0278
Number of observations	42125	42125	42125		
Wald χ^2	10811.00	10879.81	10883.32		
Pseudo R^2	0.3813	0.3822	0.3822		

Robust standard errors in brackets
***, **, *: significant at 1%, 5% and 10% respectively

Table 3: Comparison Estimates of the Impact of Communicable Disease on Labour Force Participation

Variables	Probit (Marginal Effects)	Two Stage-Residual Inclusion (2SRI)	Control Function Approach	95% Confidence Interval (Probit-Marginal Effects)	
Disease (Non-Communicable Disease is the reference category)					
Communicable disease	0.0517** (0.0243)	0.9494 (0.8804)	0.8105 (0.9344)	0.0041	0.0993
Communicable disease residual		-0.8136 (0.8821)	-1.1040 (0.9318)		
Interaction of communicable disease and communicable disease residual			0.7721** (0.3351)		
Socio-demographic characteristics					
Age	0.0623*** (0.0047)	0.1752*** (0.0150)	0.1695*** (0.0154)	0.0532	0.0714
Age squared	-0.0007*** (0.0001)	-0.0020*** (0.0002)	-0.0020*** (0.0002)	-0.0008	-0.0006
Gender (male = 1)	0.5997*** (0.0202)	1.5524*** (0.1976)	1.5943*** (0.2097)	0.5602	0.6392
Marital status (married = 1)	0.0353 (0.0360)	0.2472 (0.1883)	0.2033 (0.1970)	-0.0354	0.1059
Rural area (rural = 1)	0.1336*** (0.0234)	0.2472*** (0.0676)	0.3636*** (0.0678)	0.0877	0.1794
Transfers (transfers received =1)	0.0696* (0.0412)	0.1964* (0.1077)	0.1857* (0.1071)	-0.0111	0.1503
Education (No formal education is the reference category)					
Primary	0.0545 (0.0356)	0.2139* (0.1206)	0.2060* (0.1236)	-0.0153	0.1244

Secondary	0.0676 (0.0483)	0.2126 (0.1325)	0.1890 (0.1332)	-0.0270	0.1622
Matric/O-Level	-0.0034 (0.0417)	0.0481 (0.1319)	0.0361 (0.1361)	-0.0852	0.0784
Intermediate	0.0522 (0.0558)	0.2576 (0.1948)	0.2397 (0.2013)	-0.0571	0.1615
Degree and above	0.1147* (0.0588)	0.4000** (0.1855)	0.3816** (0.1909)	-0.0005	0.2299
Other education	-0.0042 (0.1335)	-0.1302 (0.3843)	-0.1147 (0.3885)	-0.2658	0.2574
Province (Punjab is the reference province)					
Khyber Pakhtunkhwa	-0.0823*** (0.0305)	-0.1917** (0.0971)	-0.1952** (0.0992)	-0.1421	-0.0226
Sindh	0.0728** (0.0297)	0.0634 (0.1622)	0.0869 (0.1692)	0.0146	0.1310
Balochistan	-0.0557 (0.0380)	-0.1067 (0.1214)	-0.1132 (0.1232)	-0.1301	0.0188
Number of observations	2583	2583	2583		
Wald χ^2	751.19	749.98	756.41		
Pseudo R^2	0.3546	0.3548	0.3546		

Robust standard errors in brackets
***, **, *: significant at 1%, 5% and 10% respectively

Table 4: Comparison Estimates of the Impact of Non-Communicable Disease on Labour Force Participation

Variables	Probit (Marginal Effects)	Two Stage-Residual Inclusion (2SRI)	Control Function Approach	95% Confidence Interval (Probit-Marginal Effects)	
Disease (Communicable Disease is the reference category)					
Non-communicable disease	-0.0517** (0.0243)	-0.9494 (0.8804)	-0.8105 (0.9344)	-0.0993	-0.0041
Non-communicable disease residual		0.8136 (0.8821)	0.3318 (0.9657)		
Interaction of non-communicable disease and non-communicable disease residual			0.7721** (0.3351)		
Socio-demographic characteristics					
Age	0.0623*** (0.0047)	0.1752*** (0.0150)	0.1695*** (0.0154)	0.0532	0.0714
Age squared	-0.0007*** (0.0001)	-0.0020*** (0.0002)	-0.0020*** (0.0002)	-0.0008	-0.0006
Gender (male = 1)	0.5997*** (0.0202)	1.5524*** (0.1976)	1.5943*** (0.2097)	0.5602	0.6392
Marital status (married = 1)	0.0353 (0.0360)	0.2472 (0.1883)	0.2033 (0.1970)	-0.0354	0.1059
Rural area (rural = 1)	0.1336*** (0.0234)	0.3702*** (0.0676)	0.3636*** (0.0678)	0.0877	0.1794
Transfers (transfers received =1)	0.0696* (0.0412)	0.1964* (0.1077)	0.1857* (0.1071)	-0.0111	0.1503
Education (No formal education is the reference category)					
Primary	0.0545 (0.0356)	0.2139* (0.1206)	0.2061* (0.1236)	-0.0153	0.1244

Secondary	0.0676 (0.0483)	0.2126 (0.1325)	0.1890 (0.1332)	-0.0270	0.1622
Matric/O-Level	-0.0034 (0.0417)	0.0481 (0.1319)	0.0361 (0.1361)	-0.0852	0.0784
Intermediate	0.0521 (0.0558)	0.2576 (0.1948)	0.2397 (0.2013)	-0.0571	0.1615
Degree and above	0.1147** (0.0588)	0.4000** (0.1855)	0.3816** (0.1909)	-0.0005	0.2299
Other education	-0.0042 (0.1335)	-0.1302 (0.3843)	-0.1147 (0.3885)	-0.2658	0.2574
Province (Punjab is the reference province)					
Khyber Pakhtunkhwa	-0.0823*** (0.0305)	-0.1917** (0.0971)	-0.1952** (0.0992)	-0.1421	-0.0226
Sindh	0.0728** (0.0297)	0.0634 (0.1622)	0.0869 (0.1692)	0.0146	0.1310
Balochistan	-0.0557 (0.0380)	-0.1067 (0.1214)	-0.1132 (0.1232)	-0.1301	0.0188
Number of observations	2583	2583	2583		
Wald χ^2	751.19	749.98	756.41		
Pseudo R^2	0.3546	0.3548	0.3564		

Robust standard errors in brackets
***, **, *: significant at 1%, 5% and 10% respectively

Table 5: Estimates of the Determinants of Communicable and Non-Communicable Diseases (Marginal Effects)

Variables	Communicable Disease	95% Confidence Interval (Probit-Marginal Effects)		Non-Communicable Disease	95% Confidence Interval (Probit-Marginal Effects)	
Socio-demographic characteristics						
Age	0.0625*** (0.0047)	0.0534	0.0716	0.0625*** (0.0047)	0.0534	0.0716
Age squared	-0.0007*** (0.0001)	-0.0009	-0.0006	-0.0007*** (0.0001)	-0.0009	-0.0006
Gender (male = 1)	0.6004*** (0.0202)	0.5608	0.6400	0.6004*** (0.0202)	0.5608	0.6399
Marital status (married = 1)	0.0349 (0.0360)	-0.0357	0.1056	0.0349 (0.0360)	-0.0357	0.1056
Rural area (rural = 1)	0.1331*** (0.0234)	0.0871	0.1790	0.1331*** (0.0234)	0.0871	0.1790
Transfers (transfers received =1)	0.0706* (0.0415)	-0.0106	0.1519	0.0706* (0.0415)	-0.0106	0.1519
Education (No formal education is the reference category)						
Primary	0.0542 (0.0357)	-0.0157	0.1242	0.0542 (0.0357)	-0.0157	0.1242
Secondary	0.0675 (0.0483)	-0.0273	0.1622	0.0675 (0.0483)	-0.0273	0.1622
Matric/O-Level	-0.0080 (0.0412)	-0.0887	0.0728	-0.0080 (0.0412)	-0.0887	0.0728
Intermediate	0.0519 (0.0558)	-0.0576	0.1613	0.0519 (0.0558)	-0.0576	0.1613
Degree and above	0.1132* (0.0587)	-0.0018	0.2534	0.1132* (0.0587)	-0.0018	0.2282
Other education	-0.0068 (0.1328)	-0.2671	0.2534	-0.0068 (0.1328)	-0.2671	0.2534
Province (Punjab is the reference province)						

Khyber Pakhtunkhwa	-0.0840*** (0.0305)	-0.1438	-0.0241	-0.0840*** (0.0305)	-0.1438	-0.0241
Sindh	0.0724** (0.0297)	0.0142	0.1306	0.0724** (0.0297)	0.0142	0.1306
Balochistan	-0.0533 (0.0383)	-0.1283	0.0217	-0.0533 (0.0383)	-0.1283	0.0217
Instrument						
Average distance to the medical facility that provides immunization to children (0-2 km)	0.0212 (0.1047)	-0.1840	0.2264	0.0212 (0.1047)	-0.1840	0.2264
Average distance to the medical facility that provides immunization to children (2-5 km)	-0.0632 (0.1014)	-0.2620	0.1357	-0.0632 (0.1014)	-0.2620	0.1357
Average distance to the medical facility that provides immunization to children (10-20 km)	-0.0123 (0.1607)	-0.3272	0.3026	-0.0123 (0.1607)	-0.3272	0.3026
Average distance to the medical facility that provides immunization to children (>20 km)	0.3767 (0.3297)	-0.2696	1.0229	0.3767 (0.3297)	-0.2696	1.0229
Number of observations	2583			2583		
Wald χ^2	752.81			752.81		
Pseudo R^2	0.3556			0.3556		

Robust standard errors in brackets
***, **, *: significant at 1%, 5% and 10% respectively

Appendix B

Questionnaire

Component 1: Governance and Policy Frameworks for Communicable and Non-Communicable Diseases

S.No.	Sub-Component	Question	Answers
1	Global Visions and Plans	Are there any global movements and action plans that influence the policy agenda regarding communicable and non-communicable diseases in Pakistan at the national level?	• No influence of global movements and action plans = 1 • Committed to global movements and action plans on paper but no implementation = 2 • Specific national plans and policies in line with global movements and action plans exist but are outdated = 3 • Up to date national plans and policies in line with global movements and action plans exist but lack of coherence and implementation = 4 • Clear policy agenda supported by national plans and strategies in line with global movements and action plans with strong complementarity and implementation = 5
		What is Pakistan's progress on achieving Sustainable Development Goal 3 (ensure healthy lives and promote well-being for all at all ages) targets and indicators addressing communicable and non-communicable diseases in Pakistan?	• Major challenges remain and decline in progress = 1 • Major challenges remain and progress has stagnated = 2 • Major challenges remain but slowly improving = 3 • Challenges remain with moderate improvement but progress is insufficient to attain the goal = 4 • On track or maintaining SDG 3 achievement = 5
		Has Pakistan incorporated the Global Health Security Agenda (GHSA) 2024 Framework in its policies to achieve the goal of being safe from public health threats posed by communicable diseases in Pakistan?	• No influence of GHSA 2024 Framework in policies = 1 • Committed to GHSA 2024 Framework but no implementation = 2 • Specific national plans and policies in line with GHSA 2024 Framework exist but outdated = 3 • Up to date national plans and policies in line with GHSA 2024 Framework exist but lack of coherence and implementation = 4 • Clear policy agenda supported by national plans and strategies in line with GHSA 2024 Framework with strong

			complementarity and implementation = 5
		Has Pakistan integrated WHO's Global Action Plan for the Prevention and Control of Non-Communicable Diseases into its health-planning processes and development plans in order to achieve its national non-communicable disease targets and indicators?	• No influence of WHO's Global Action Plan in policies = 1 • Committed to WHO's Global Action Plan but no implementation = 2 • Specific national plans and policies in line with WHO's Global Action Plan exist but outdated = 3 • Up to date national plans and policies in line with WHO's Global Action Plan exist but lack of coherence and implementation = 4 • Clear policy agenda supported by national plans and strategies in line with WHO's Global Action Plan with strong complementarity and implementation = 5
		Has Pakistan incorporated WHO's Global Plan of Action on Workers' Health for 2008-2017 to protect the health of workers at the workplace?	• No influence of WHO's Global Plan of Action on Workers' Health in policies = 1 • Committed to WHO's Global Plan of Action on Workers' Health but no implementation = 2 • Specific national plans and policies in line with WHO's Global Plan of Action on Workers' Health exist but outdated = 3 • Up to date national plans and policies in line with WHO's Global Plan of Action on Workers' Health exist but lack of coherence and implementation = 4 • Clear policy agenda supported by national plans and strategies in line with WHO's Global Plan of Action on Workers' Health with strong complementarity and implementation = 5
2	National Policies and Plans	Does Pakistan's National Health Vision 2016-2025 developed by the Ministry of National Health Services Regulations and Coordination include targeted strategies/interventions to reduce the incidence and impact of communicable and non-communicable diseases on the population?	• Does not include targeted strategies/interventions = 1 • Includes targeted strategies/interventions but only on paper with no implementation = 2 • Includes targeted strategies/interventions but with weak implementation and no coordination with provincial departments = 3 • Includes targeted strategies/interventions but with moderate implementation and some coordination with provincial departments = 4 • Includes targeted strategies/interventions with strong implementation and functioning institutionalized linkages and

			coordination between federal and provincial bodies = 5
		Has Pakistan achieved 2020's milestones regarding communicable and non-communicable diseases set under the Ministry of National Health Services Regulations and Coordination's Action Plan 2019-2023?	• Has not achieved 2020's milestones and is far behind in achieving them = 1 • Has not achieved 2020's milestones but progress has stagnated = 2 • Has not achieved 2020's milestones but moderately improving = 3 • Has not achieved 2020's milestones but close to achieving them = 4 • Has achieved 2020's milestones = 5
		Does the Ministry of National Health Services Regulations and Coordination have an operational multi-sectoral national strategy or action plan that integrates the major communicable diseases?	• Does not have an operational multi-sectoral national strategy or action plan = 1 • Has an operational multi-sectoral national strategy or action plan but only on paper with no implementation = 2 • Has an operational multi-sectoral national strategy or action plan but with weak implementation and no coordination with provincial departments = 3 • Has an operational multi-sectoral national strategy or action plan but with moderate implementation and some coordination with provincial departments = 4 • Has an operational multi-sectoral national strategy or action plan with strong implementation and functioning institutionalized linkages and coordination between federal and provincial bodies = 5
		Does the Ministry of National Health Services Regulations and Coordination have an operational multi-sectoral national strategy or action plan that integrates the major non-communicable diseases and their shared risk factors?	• Does not have an operational multi-sectoral national strategy or action plan = 1 • Has an operational multi-sectoral national strategy or action plan but only on paper with no implementation = 2 • Has an operational multi-sectoral national strategy or action plan but with weak implementation and no coordination with provincial departments = 3 • Has an operational multi-sectoral national strategy or action plan but with moderate implementation and some coordination with provincial departments = 4

			• Has an operational multi-sectoral national strategy or action plan with strong implementation and functioning institutionalized linkages and coordination between federal and provincial bodies = 5
		Does Pakistan have a dedicated Ministry or Department that protects, promotes and improves the health of workers at the workplace including the prevention and control of communicable and non-communicable diseases, employment conditions, access to health services, improved health system responses to workers' health and health coverage?	• No dedicated Ministry or Department =1 • No dedicated Ministry or Department but many Ministries/Departments/Bodies exist using their own systems and processes = 2 • Several Ministries/Departments/Bodies exist with overlapping mandates and limited level of coordination = 3 • Clear responsibility and roles exist between several Ministries/Departments/Bodies though not for all diseases = 4 • One Ministry/Department/Body tasked (or multiple agencies with designated roles and responsibilities) and covers all diseases = 5

Latent (1)	Nascent (2)	Emerging (3)	Established (4)	Advanced (5)
Weak to non-existent governance and policy frameworks with no compliance with global visions and plans and/or no national policies and plans in place	Limited governance due to lack of targeted interventions, without coherence between the visions, strategies and action plans	Governance and policy frameworks exist but lack of implementation, unclear roles and responsibilities, and lack of coordination between federal and provincial bodies	Compliance with global visions and plans, national policies in place and recognized roles and responsibilities of federal and provincial bodies though some gaps and weaknesses remain (could be some overlaps)	Strong governance and policy framework with recognized roles and responsibilities and institutionalized coordination established between all relevant federal and provincial bodies without overlaps

Component 2: Health Financing

S. No.	Sub-Component	Questions	Answers
1	Health Expenditure in Pakistan	Does the Government have a national strategy setting out commitments to increase public health expenditure and reduce out-of-pocket health expenditure?	• Does not have a national strategy = 1 • Has a national strategy but only on paper with no implementation = 2 • Has a national strategy but with weak implementation and no coordination with provincial departments = 3 • Has a national strategy but with moderate implementation and some coordination with provincial departments = 4 • Has a national strategy with strong implementation and functioning institutionalized linkages and coordination between federal and provincial bodies = 5
2	Universal Health Coverage in Pakistan	Does the Government have any national/provincial scheme(s) to achieve Universal Health Coverage in Pakistan?	• Does not have any national/provincial scheme(s) = 1 • Has national/provincial scheme(s) but only on paper with no implementation = 2 • Has national/provincial scheme(s) but with overlapping mandates and no coordination = 3 • Has national/provincial scheme(s) but with overlapping mandates and limited level of coordination = 4 • National and provincial schemes with designated roles and responsibilities to the relevant bodies and strong implementation = 5
3	Sehat Sahulat Programme	Has the Sehat Sahulat Programme achieved progress in reducing out-of-pocket health expenditure?	• Major challenges remain and decline in progress = 1 • Major challenges remain and progress has stagnated = 2 • Major challenges remain but slowly improving = 3 • Challenges remain with moderate improvement but progress is insufficient to attain the goal = 4 • On track or achieving progress = 5
		Does the current benefit package under the Sehat Sahulat Programme include any provision of financial health coverage to people	• Does not include provision of financial health coverage for communicable/non-communicable diseases = 1 • Includes provision of financial health coverage for limited communicable/non-communicable diseases = 2 • Includes provision of financial health coverage for many

		with communicable and non-communicable diseases?	communicable/non-communicable diseases but insufficient coverage = 3 • Includes include provision of financial health coverage for most communicable/non-communicable diseases with sufficient coverage = 4 • Includes provision of full financial health coverage for all communicable/non-communicable diseases = 5
		Are empanelled medical health facilities providing quality health services to people with communicable and non-communicable diseases?	• All provide low quality health services = 1 • Most provide low quality health services and some provide high quality health services = 2 • All or some provide moderate quality health services = 3 • Most provide high quality health services and some provide low quality health services = 4 • All provide high quality health services = 5
		What is the utilization rate of the Sehat Sahulat Programme?	• Very low utilization = 1 • Low utilization = 2 • Moderate utilization = 3 • High utilization = 4 • Very high utilization = 5
4	Provincial Employees Social Security Ordinance	Does Pakistan have any national or provincial policies or schemes providing health coverage to workers/employees?	• Does not have any national/provincial scheme(s) = 1 • Has national/provincial scheme(s) but only on paper with no implementation = 2 • Has national/provincial scheme(s) but with overlapping mandates and no coordination = 3 • Has national/provincial scheme(s) but with overlapping mandates and limited level of coordination = 4 • National and provincial schemes with designated roles and responsibilities to the relevant agencies and strong implementation = 5

Latent (1)	Nascent (2)	Emerging (3)	Established (4)	Advanced (5)
No government strategy/analysis for health expenditure on communicable and non-communicable diseases and non-existent schemes to achieve universal health coverage	Strategy for health financing under development, weak schemes to achieve universal health coverage with no coordination between federal and provincial bodies	Strategy to reduce out of pocket health expenditure and health insurance schemes in place but lack of coverage, low utilization and lack of coordination between federal and provincial bodies and schemes	National and provincial health insurance schemes in place but with overlapping mandates and limited level of coordination between federal and provincial bodies and schemes	Achieved universal health coverage as national and provincial health insurance schemes in place, providing full financial coverage and with designated roles and responsibilities to the relevant agencies

Component 3: Programmes Targeted at Communicable and Non-Communicable Diseases

S. No.	Sub-Component	Questions	Answers
1	Programmes Targeted at Communicable Diseases	Are there any vertical programmes aimed at eliminating communicable diseases in Pakistan?	• No vertical programmes =1 • Vertical programmes for some communicable diseases but with no coordination between federal and provincial bodies = 2 • Vertical programmes for some communicable diseases but with limited level of coordination between federal and provincial bodies = 3 • Several vertical programmes for most communicable diseases with overlapping mandates and limited level of coordination between federal and provincial bodies = 4 • Vertical programmes for most communicable diseases with functioning institutionalized linkages and coordination between federal and provincial bodies = 5
		Do any of the existing programmes/policies or are there any separate programmes/policies that address the control of communicable diseases in the workplace?	• No such programmes/policies =1 • Programmes/policies introduced by some organizations but with no coordination with the government = 2 • Programmes/policies introduced by some organizations but with limited level of coordination with the government = 3 • Programmes/policies introduced by most organizations with some coordination with the government = 3 • Programmes/policies introduced by all organizations and with functioning institutionalized linkages and coordination with the government = 5
		Is there multi-sectoral coordination between health and non-health sectors such as labour, tax, trade, education and urban planning to ensure that awareness regarding the spread of communicable diseases is factored into policies and plans at the national and provincial levels?	• No coordination between health and non-health sectors = 1 • Coordination plan exists but no implementation = 2 • Coordination between health and some non-health sectors but with limited coordination at the federal and provincial levels = 3 • Coordination between health and some non-health sectors at the federal and provincial levels = 4 • Fully functioning institutionalized linkages and coordination

			between health and non-health sectors at the federal and provincial levels = 5
2	Programmes Targeted at Non-Communicable Diseases	Are there any vertical programmes aimed at the early detection and management of major non-communicable diseases like cardiovascular diseases, diabetes, chronic respiratory diseases and cancers?	• No vertical programmes =1 • Vertical programmes for some non-communicable diseases but with no coordination between federal and provincial bodies = 2 • Vertical programmes for some non-communicable diseases but with limited level of coordination between federal and provincial bodies = 3 • Several vertical programmes for most non-communicable diseases with overlapping mandates and limited level of coordination between federal and provincial bodies = 4 • Vertical programmes for most non-communicable diseases with functioning institutionalized linkages and coordination between federal and provincial bodies = 5
		Has the government introduced policy and regulatory measures addressing the behavioural risk factors of non-communicable diseases?	• Does not have policy and regulatory measures = 1 • Has policy and regulatory measures but only on paper with no implementation = 2 • Has policy and regulatory measures but with weak implementation and no coordination with provincial departments = 3 • Has policy and regulatory measures but with moderate implementation and some coordination with provincial departments = 4 • Has policy and regulatory measures with strong implementation and functioning institutionalized linkages and coordination between federal and provincial bodies = 5
		Are there any programmes that address the early prevention, detection and management of non-communicable diseases for workers in the workplace?	• No such programmes/policies =1 • Programmes/policies introduced by some organizations but with no coordination with the government = 2 • Programmes/policies introduced by some organizations but with limited level of coordination with the government = 3 • Programmes/policies introduced by most organizations with some coordination with the government = 3

			• Programmes/policies introduced by all organizations and with functioning institutionalized linkages and coordination with the government = 5
		Is there multi-sectoral coordination between health and non-health sectors such as labour, tax, trade, education and urban planning to ensure that awareness regarding the exposure of individuals to modifiable risk factors for non-communicable diseases are factored into policies and plans at the national and local levels?	• No coordination between health and non-health sectors = 1 • Coordination plan exists but no implementation = 2 • Coordination between health and some non-health sectors but with limited coordination at the federal and provincial levels = 3 • Coordination between health and some non-health sectors at the federal and provincial levels = 4 • Fully functioning institutionalized linkages and coordination between health and non-health sectors at the federal and provincial levels = 5

Latent (1)	Nascent (2)	Emerging (3)	Established (4)	Advanced (5)
Non-existent programmes/intervention and policy/regulatory measures targeted at communicable and non-communicable diseases and their risk factors	Ad hoc programming and policy measures with no coordination between federal and provincial bodies	Targeted programmes/interventions and policy measures exist for some communicable and non-communicable diseases but poor implementation at the federal and provincial levels	Targeted programmes/interventions and policy measures exist for major communicable and non-communicable diseases with overlapping mandates and some coordination between federal and provincial bodies	Targeted programmes/interventions and policy measures exist for major communicable and non-communicable diseases with fully functioning institutionalized linkages and coordination between health and non-health sectors at the federal and provincial levels