

Disability prevalence and trends

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Question

What are the global trends regarding disability prevalence that we are anticipating until 2030? In answering this question please consider: How will this vary according to geography, economic projections, and other factors? We know we will have an ever ageing population, but what about the prevalence of other types of disability that are borne out of chronic illness, disease, and conflict and other factors? What are the links between disability prevalence and non-communicable diseases such as strokes, cancer, and heart disease? What are the trends and prevalence of mental health related disabilities? What are the trends and prevalence of disability in terms of age and sex?

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1. Introduction

This report provides a rapid review of the evidence that exists regarding the global trends and disability prevalence. The evidence included was found using a desk-based internet search.

The K4D helpdesk service provides brief summaries of current research, evidence, and lessons learned. Helpdesk reports are not rigorous or systematic reviews; they are intended to provide an introduction to the most important evidence related to a research question. They draw on a rapid desk-based review of published literature and consultation with subject specialists.

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Additional sources were suggested by a number of experts, who were consulted as part of the process. All of the evidence included was written in English. This report was written in five days. The author recognises that the theme of disability is broad and that the time assigned does not reflect the importance of the topic. This report was designed to provide a brief overview of the key issues, and a summary of pertinent evidence found within the time permitted. The author recognises that the review process was non-systematic and non-exhaustive.

There is clear scope for further work on this topic. It is recommended that follow up work focuses on the known drivers of disability and the established trends for those drivers for the next decade in various contexts. The structure of the current report, as defined by the question and limited by the terms of the helpdesk service, did not allow for detailed analysis of this nature.

There was some cross over noted between sections. Due to time restrictions, analysis of trends relevant to various themes was not possible. For example, it would be interesting to investigate the impact on disability of conflict *and* age, or the impact on disability of geographic factors *and* chronic illness.

2. Summary

Defining disability

The report begins by addressing the challenge of defining disability. It is recognised that there is variation in the nature and severity of disability, and that no single description is adequate to define it (Mont 2007; DFID 2015). Despite this challenge, the definition the UN Convention on the Rights of Persons with Disabilities (UNCRPD) (2006) provides is useful and appropriate, as it defines persons with a disability as including those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others.

Measuring disability

Techniques for measuring disability vary depending on the purpose for measuring it (Mont 2007). Measurements of disability remain predominantly medical, despite general recognition that both medical and social elements of disability should be considered (Aslam 2013). This may include considering the relationship between a person's impairment and their environment (Al Ju'beh 2015).

The UK's Department for International Development (DFID) advocate for the *Washington Group Short Set* of questions to be used to assess disability prevalence (DFID 2015). The Washington Group on Disability Statistics (WG) aims to establish comparable population based measures of disability (Washington Group 2017). It applies an International Classification of Functioning, Disability and Health (ICF) based approach to disability, understanding functioning and disability as an interaction between health conditions and contextual factors, both personal and environmental (WHO and World Bank 2011).

Prevalence

The definition of disability, the quality and methods of data collection, rigour of sources and varying disclosure rates are factors influencing the prevalence of disability (Mont 2007; Al Ju'beh 2015). Poor service provision and stigma may result in lower disclosure. National statistics can be misleading, incomparable and inaccurate. These limitations may result in a higher prevalence of disability in developed countries being reported compared to developing countries (Al Ju'beh 2015). Poor service provision, stigma and predominantly collecting data through census result in

lower income countries recording lower disability prevalence rates compared to higher income countries (WHO and World Bank 2011). Despite these potential influences, the data that does exist indicates that low and middle income countries in reality do have higher disability prevalence compared to high income countries (Mitra and Sambamoorthi 2014).

The WHO and World Bank (2011) estimate that over a billion people (or 15% of the global population) have a disability. This estimate is known to have limitations. This figure is based on data from the World Health Survey and the Global Burden of Disease, which estimate that the disability prevalence is 15.6% and 19.4% respectively. The Global Burden of Disease estimates childhood disability prevalence to be 95 million (5.1%) children, of whom 13 million (0.7%) have severe disability. A lack of consistent approach across countries to disability definitions and survey questions has made comparison of prevalence challenging (WHO and World Bank 2011). Analysis of World Health Survey data for 54 countries estimated global prevalence of disability to be 14% (Mitra and Sambamoorthi 2014).

Geographic factors

Disability prevalence is influenced by factors that vary across countries including trends in health conditions, environmental factors and other variables such as road traffic crashes, natural disasters, conflict, diet, and substance abuse. For example, an estimated 20 to 50 million people are injured by road traffic crashes each year. The number of people disabled as a result of these crashes is not well documented, although road traffic injuries are estimated to account for 1.7% of all years lived with disability. People who have a low income, are out of work, or have low educational qualifications are at an increased risk of disability. When compared to other children, those from poorer households are known to be at a significantly higher risk of disability (WHO & World Bank 2011). Disability prevalence rates have been shown to vary significantly regionally as well as nationally. Disability can be influenced by geographical characteristics as well as policy (Mont and Nguyen 2013).

Natural disasters are another geographic factor. Their scale and frequency varies across countries and regions. However, the impact of natural disasters on disability prevalence in the context of the Haitian earthquake has been shown to be not as relevant as age (Danquah et al 2015).

Economic projections

The relationship between disability and poverty is ill-defined and under-researched (Groce et al 2011). Evidence establishing a causal relationship between the two is lacking, although a relationship is hypothesised (Mont 2007, WHO & World Bank 2011). Low and middle income countries have higher disability prevalence compared to high income countries (Mitra and Sambamoorthi 2014). The evidence that does exist suggests poor people are more likely to have a disability due to a number of factors including greater risk of ill health and injuries, unsanitary and substandard housing, malnourishment, lack of basic sanitation, unsafe work, and violent environments. They are less likely to be able to afford medical care, which may prevent disability (Groce et al 2011).

Evidence from Rwanda suggests adults having any level of income at all have about half the odds of disability compared to adults with no income, despite no indication that disability decreases as income rises (Kiregu et al 2016). A study of 15 low income countries found disability is significantly associated with higher levels of multidimensional poverty (Mitra, Posarac and Vick 2013). Poor people are more likely to be disabled, and people with disabilities are less likely to be employed and generally earn less even when employed (WHO & World Bank 2011).

Research has shown that the prevalence of specific disabilities, such as hearing loss, decreases exponentially as income increases (WHO and CBM 2013). Most people who are blind or visually impaired live in Asia and age-standardised prevalence of blindness is highest in Africa and Asia (Bourne et al 2017).

Disability and conflict

Conflict generates injuries and trauma that can lead to disabilities. This may be exacerbated by delays in accessing care and rehabilitation for the injured. Violence and conflict account for 1.4% of all years lived with disability (WHO & World Bank 2011).

Evidence from Vietnam suggests a positive and statistically significant impact of bombing on disability rates over 30 years after the war had ended. Impact was highest for severe disability among persons born before 1976, but a significant positive impact was also found for persons born in the post war years (Groce et al 2015). A study on landmines and unexploded ordnance in Afghanistan reported that they result in death and injury in children and adults in high numbers (Bilukha, Brennan and Anderson 2007). A previous study on Chechnya reported that the number of injured subsided rapidly after the war ended (Bilukha et al 2006). Evidence from Rwanda found that although prevalence of disability caused by musculoskeletal impairment was relatively high, only 0.3% of cases were related to the war (Kuper et al 2009).

Disability and chronic illness/non-communicable diseases

Disability prevalence is known to be increasing due to a global increase in chronic health conditions. Such conditions are estimated to account for 66.5% of all years lived with disability in low-income and middle income countries (WHO & World Bank 2011). The global increase in diabetes, cardiovascular diseases, mental disorders, cancer, and respiratory illnesses will have a profound effect on disability. Large increases in non-communicable disease related disabilities are projected for developing regions caused by population ageing, reduction in infectious conditions, lower fertility, and changing lifestyles related to tobacco, alcohol, diet, and physical activity (WHO & World Bank 2011).

Despite a fall in high risk life style choices in high income contexts, prevalence of obesity and diabetes have been increasing, which may increase the disability burden, including the prevalence of dementia. In low and middle income contexts, obesity, stroke, and heart disorders are increasing, and may cause an upward trend in the incidence and prevalence of dementia (Prince et al. 2015).

The global prevalence of diabetes is 422 million and has quadrupled since the 1980s (WHO 2016). Diabetes prevalence is rising faster in low and middle income countries than in high income countries. Diabetic retinopathy causes blindness. Globally, 93 million people have diabetic retinopathy, of these, 17 million have proliferative diabetic retinopathy (Yau et al 2012). Diabetes can also lead to limb amputation and several other long-term consequences. There are no global estimates of diabetes-related lower-extremity amputations (WHO 2016). Data that does exist indicates a reduction in diabetes linked amputations in high income contexts (Moxey et al 2011). No estimates are available for lower and middle income countries.

Cerebral palsy is a common cause of childhood physical disability. Current prevalence is 2.11 per 1000 live births – a figure that has remained constant in recent years despite increased survival of at-risk preterm infants. The majority of data on cerebral palsy prevalence is from high income contexts (Oskoui et al 2013).

The global prevalence of dementia is 46.8 million people. This number is expected to increase to 131.5 million by 2050. Much of the increase will disproportionately affect lower and middle income countries, where, in 2015, 58% of all people with dementia currently live. It is estimated that this figure will rise to 63% in 2030 and 68% in 2050 due to rising life expectancy, which is associated with increased prevalence of dementia. In addition to the impact of an increasingly ageing population, poorer countries may have fewer resources to address dementia (Prince et al 2015)

Mental health related disabilities

A global increase in mental illness has contributed to the rising global disability prevalence (WHO & World Bank 2011). An increase in mental illness and substance use disorders is known to have driven recent increases in years lived with disability (YLDs) (Vos et al 2013). Mental disorders are commonly occurring in many countries and contexts. Prevalence estimates of 12-month serious mental illness range between 0.8 and 6.8%. Many mental disorders begin in transition between childhood and adolescence (Kessler et al 2009).

In 2010, on a global level, mental and substance use disorders accounted for 7.4% of all disability-adjusted life years (DALYs) and 22.9% of all YLDs, making it the leading cause of YLDs worldwide. Between 1990 and 2010, mental and substance use disorders increased by 37.6%, mainly due to population growth and ageing (Whiteford et al 2013). A quarter of the global population will experience a mental health condition within their lifetime. People affected by conflict are likely to experience immense mental and psychosocial suffering and are likely to be among the most at risk (Tsutsumi, Izutsu and Ito 2015).

Age and disability

Age is linked to increasing difficulties in functioning; as populations age, the prevalence of disability will increase (WHO & World Bank 2011). Globally, disability prevalence is estimated to be 12% for working age adults and 39% among the elderly (Mitra and Sambamoorthi 2014). Evidence from Haiti suggests that disability prevalence was relatively low up until the age of 40, and increased dramatically for older people. Age was found to be a more significant driver of disability than the earthquake of 2010 (Danquah et al 2015).

For example, functional presbyopia affected 80% of people aged 35 years and older. The prevalence of blindness increased by 17.6% between 1990 and 2015 due to population growth (38.4%), population ageing (34.6%), and reduction in age-specific prevalence (-36.7%). The prevalence of visual impairment increased from 159.9 million to 216.6 million cases over the same period, indicating that the ageing of the world's population is causing a substantial increase in vision related disability (Bourne et al 2017). Another example is hearing related disability. Globally, 15% of the adult population have disabling hearing loss. Approximately 25% of people with hearing loss are aged above 65 years (WHO and CBM 2013).

While evidence supporting the link between ageing populations and disability is growing, data on childhood disability is still limited. This is in part due to a lack of consistent definitions and measures, contributing to challenges in producing reliable and comparable statistics (Cappa, Petrowski and Njelesani 2015). A key challenge in measuring childhood disability is distinguishing limitations from variations in child development (Aslam 2013).

In terms of the impact of conflict, evidence from Afghanistan reported that children were more likely to sustain upper limb amputation (24.3%) due to landmines and unexploded ordnance, compared with adults (14.8%), whereas a higher proportion of injured adults (25.5%) than

children (11.5%) sustained lower limb amputation (Bilukha, Brennan and Anderson 2007). Evidence from Chechnya reported that children were more likely to be injured by unexploded ordnance and to sustain upper body injury and upper limb amputations compared with adults (Bilukha et al 2006).

Sex and disability

Globally, women have a higher prevalence of disability than men (WHO & World Bank 2011, Mitra and Sambamoorthi 2014).

For some disabilities, such as dementia, the gender specific prevalence is not expected to vary over time, with population ageing driving projected increases (Prince et al. 2015). Women are known to have a higher prevalence for other types of disability, such as blindness, (56%) severe visual impairment (55%) and mild visual impairment (54%) (Bourne et al 2017).

For other disabilities a reverse to this trend is observed. For example, more men are affected by disabling hearing loss (56%) (WHO and CBM 2013). In terms of the impact of conflict on disability, evidence from Afghanistan and Chechnya suggests men are more affected than women, with 91.3% and 81% of injuries reported among males respectively (Bilukha, Brennan and Anderson 2007).

3. Disability prevalence

Definition

There is no single correct definition of disability. The nature and severity of disabilities vary greatly (Mont 2007). DFID (2015) acknowledge that there cannot be a one-size fits all definition of disability. UNCRPD (2006) define persons with a disability as including those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others. DFID (2015) state that an impairment is disabling when individuals are prevented from participating fully in society because of social, political, economic, environmental or cultural factors. Disability can be defined as the relationship between a person's impairment and their environment (Impairment + barrier = disability or Impairment + accessible environment = inclusion) (Al Ju'beh 2015).

Measuring disability

How one measures disability differs depending on the purpose for measuring it (Mont 2007). Self-reporting disability is one way of measuring it, and may involve a person expressing at least one severe or extreme difficulty with bodily functions (seeing, concentrating) and activities (moving around, self-care) (Mitra and Sambamoorthi 2014). UNICEF's State of the World's Children report from 2013 argues that while there is general agreement that definitions of disability should incorporate both medical and social determinants, the measurement of disability is still predominantly medical, with a focus on specific physical or mental impairments (Aslam 2013).

In a discussion paper for the World Bank, Mont (2007) describes the different approaches taken in generating disability prevalence estimates as including:

- Self-identification as disabled. In this instance, the respondent is directly asked if they are disabled.
- Diagnosable conditions. The respondent is read a list of conditions, such as polio, epilepsy, paralysis, etc. and is asked if they have any of them.
- Activities of Daily Living (ADL). The respondent is classified as disabled if they have difficulty performing any ADLs, which are task based and centre on basic activities such as dressing, bathing, and feeding oneself.
- Instrumental Activities of Daily Living (IADL). This approach is similar to the ADLs except that IADLs are higher order tasks. Examples include whether a person has problems managing money, shopping for groceries, or maintaining their household.
- Participation. This method asks if the person has some condition which affects a particular social role, such as attending school or being employed.

DFID require all partners to disaggregate their programme data by disability status where it is possible. For national censuses and surveys, DFID advocate for the *Washington Group Short Set* of questions to be used to assess disability prevalence (DFID 2015). The Washington Group on Disability Statistics (WG) is a UN city group established under the United Nations Statistical Commission. It aims to address the urgent need for cross-nationally comparable population based measures of disability. Its mandate is the promotion and co-ordination of international co-operation in the area of health statistics focusing on disability data collection tools suitable for censuses and national surveys. The Group has designed a short set of six questions on functioning designed primarily for censuses as well as an extended set of questions on functioning for surveys. It is also working with UNICEF to develop a survey module on child functioning, which is currently being tested (Washington Group 2017). The Washington Group applies an International Classification of Functioning, Disability and Health (ICF) based approach to disability and follows the principles and practices of national statistical agencies as defined by the United Nations Statistical Commission. The ICF understands functioning and disability as a dynamic interaction between health conditions and contextual factors, both personal and environmental. Promoted as a “bio-psycho-social model”, it represents a workable compromise between medical and social models. Disability is the umbrella term for impairments, activity limitations and participation restrictions, referring to the negative aspects of the interaction between an individual (with a health condition) and that individual's contextual factors (environmental and personal factors) (WHO and World Bank 2011).

Prevalence

The contested definition of disability is one factor that complicates attempts to obtain an exact disability prevalence figure. Other factors include the quality and methods of data collection, rigour of sources and varying disclosure rates (Mont 2007; Al Ju'beh 2015). Poor service provision and stigma may result in lower disclosure. National statistics can be misleading, incomparable and inaccurate. These limitations may result in a higher prevalence of disability in developed countries being reported compared to developing countries (Al Ju'beh 2015). Developing countries have predominantly collected disability data through censuses or use measures focused exclusively on a narrow choice of impairments. These countries tend to report low disability rates. Countries that collect their data through surveys and measure activity limitations and participation restrictions in addition to impairments tend to report higher prevalence. Data gathered from institutionalised populations tends to result in higher prevalence rates (WHO and World Bank 2011). Despite these potential influences, the evidence suggests

that low and middle income countries do in reality have higher disability prevalence, in comparison to high income countries (Mitra and Sambamoorthi 2014).

Based on 2010 global population estimates, the WHO and World Bank (2011) estimate that more than a billion people live with some form of disability. This equates to 15% of the world's population, which is 5% higher than a previous WHO estimate from the 1970s. The two sources of statistical information that underpin the 2011 estimate of global disability prevalence are the World Health Survey and the Global Burden of Disease. Estimates reflect current knowledge and available data as both sources are known to have limitations with regard to measuring disability. In the past, national survey and census data could not be compared directly with either of these sources as there was no consistent approach across countries to disability definitions and survey questions (WHO and World Bank 2011).

The World Health Survey estimates that around 785 million (15.6%) persons 15 years and older live with a disability. The Global Burden of Disease estimates a figure of around 975 million (19.4%) persons. Of these, 110 million people (2.2%) have significant difficulty functioning, while 190 million (3.8%) have "severe disability" – the equivalent of disability inferred for conditions such as quadriplegia, severe depression, or blindness. Only the Global Burden of Disease measures childhood disabilities (0–14 years), which is estimated to be 95 million (5.1%) children, of whom 13 million (0.7%) have severe disability (WHO and World Bank 2011).

A retrospective analysis of data from the World Health Survey (2002-2004) for 54 countries estimated global prevalence of disability to be 14%. For this study disability was measured as having at least one severe or extreme difficulty with bodily functions (seeing, concentrating) and activities (moving around, self-care) based on an individual's self-reports (Mitra and Sambamoorthi 2014).

4. The impact of geography, economic projections and other factors on disability prevalence

Geographic factors

Disability prevalence is influenced by numerous factors that vary from country to country. These factors include trends in health conditions, environmental factors and other variables such as road traffic crashes, natural disasters, conflict, diet, and substance abuse. People who have a low income, are out of work, or have low educational qualifications are at an increased risk of disability. When compared to other children, those from poorer households are known to be at a significantly higher risk of disability (WHO & World Bank 2011). Disability prevalence rates vary significantly within a county even at the district level. For example, prevalence, incidence and trends in diabetes and related disabilities have been shown to vary hugely between countries (WHO 2016). Disability prevalence can vary at the district level and the strength of the correlation lessens based on district characteristics that can be affected by policy. Districts with better health care and infrastructure, such as roads and health services, show less of a link between disability and poverty. This suggests that improvements in infrastructure and rehabilitation services can lessen the impact of disability on families with disabled members (Mont and Nguyen 2013).

The prevalence and severity of natural disasters varies dramatically. The impact of natural disasters on disability prevalence has been shown to be not as relevant as age. A study involving 3,132 subjects focused on disability in post-earthquake Haiti and found prevalence to be 4.1%.

The earthquake was found to be the second leading cause of disability, after communicable/non-communicable diseases. Disability was however found to be linked to increasing age. The prevalence of disability remained relatively low up until the age of 40, at which point it increased dramatically. Almost one in four people aged 60 years and older were found to have a disability. Poverty indicators were not found to relate to disability (Danquah et al 2015).

Economics and disability

Empirical evidence on the relationship between disability and poverty differs greatly between countries. Most of the evidence that does exist comes from developed countries. But longitudinal data sets to establish the causal relation between disability and poverty are lacking, even from developed countries (WHO & World Bank 2011).

Data that can disentangle the relationship between poverty and disability is not readily available. Despite the lack of data, it has been hypothesised that disability and poverty are intricately interlinked (Mont 2007). Research by Mont and Nguyen (2013) focused on Vietnam examines this interrelationship. Correlation between disability and poverty was shown to vary at the district level and the strength of the correlation lessens based on district characteristics that can be affected by policy.

Based on the results of a retrospective analysis of data from the World Health Survey (2002-2004) for 54 countries, low and middle income countries were found to have higher disability prevalence compared to high income countries (Mitra and Sambamoorthi 2014). In their review of existing knowledge and theory regarding the disability–poverty nexus, Groce et al (2011) describe the relationship between disability and poverty as ill-defined and under-researched. They report that few studies provide robust and verifiable data that explore the intricacies of the disability-poverty relationship. From the evidence that does exist, it is known that those who live in chronic poverty are more likely to have a disability. They are likely to be at risk of ill health and injuries, live in unsanitary and substandard housing, be malnourished, lack access to water and basic sanitation, are more likely to have unsafe or dangerous jobs, and live in areas where there is a higher probability that they will be victims of violence. The poor are less likely to be able to afford medical care that would keep an illness or injury from becoming a permanent disability. These poverty-related environmental and structural risks for disability mean that the poor who become disabled will descend further into poverty (Groce et al 2011). A more nuanced analysis is required that reflects the complex world within which poverty among persons with disabilities must be considered.

A study focused on socioeconomics and disabilities in Rwanda reported that having any income was associated with lower disability rates. Adults in all income groups had about half the odds of disability compared to adults with no income. However, looking at the relationship between disability and multiple levels of income, no indication that disability decreases as income rises was found (Kiregu et al 2016). A study by Mitra, Posarac and Vick (2013) used internationally comparable data to draw an economic profile of persons with disabilities in 15 developing countries. They found that in most countries, disability is significantly associated with higher multidimensional poverty. Also, among persons with disabilities, persons aged 40 and above and persons with multiple disabilities were more likely to be multi-dimensionally poor

Persons with disabilities and households with a disabled member experience higher rates of deprivations than persons and households without a disability. This includes increased food insecurity, poor housing, lack of access to safe water and sanitation, and inadequate access to

health care and fewer assets. People with disabilities may have extra costs for support, care or assistive devices. Disabled people in low income countries are 50% more likely to experience catastrophic health expenditure than non-disabled people (WHO & World Bank 2011). Not only are poor people more likely to be disabled, but people with disabilities are more likely to be unemployed and generally earn less even when employed. Globally, employment rates for disabled men (53%) and disabled women (20%) are lower than for non-disabled men (65%) and women (30%). Working-age persons with disabilities have been shown to face significant labour market disadvantages and worse labour market outcomes than working age persons without disabilities. The employment rate of working-age persons with disabilities is 44%, compared to 75% for persons without disability (WHO & World Bank 2011).

There is evidence that the prevalence of certain disabilities is directly linked to poverty. Hearing loss is unevenly and unequally distributed across the world. Prevalence decreases exponentially as income increases. Over 90% of the burden of chronic ear infections is borne by countries in the South-East Asia, Western Pacific and African Regions, and ethnic minorities in the Pacific Rim (WHO and CBM 2013). Most people who are blind or visually impaired live in south Asia, east Asia, and southeast Asia. Age-standardised prevalence of blindness is highest in western sub-Saharan Africa, eastern sub-Saharan Africa, and south Asia (Bourne et al 2017).

5. Links between disability and conflict

Conflict is known to generate injuries and trauma that can result in disabilities. For the injured, the situation is often exacerbated by delays in obtaining emergency health care and longer-term rehabilitation. Violence and conflict are estimated to account for 1.4% of all years lived with disability (WHO & World Bank 2011).

An analysis of the impact of US bombing between 1965 and 1975 on the disability status of individuals in Vietnam reports a positive and statistically significant impact of war time bombing exposure on district level disability rates in 2009. Impacts are highest for severe disability and among persons born before 1976. On-going exposure to unexploded ordinance, landmines and chemical weapons of war resulted in a smaller yet significant positive impact on persons born after the war had finished (Groce et al 2015).

A study examining the trends of injuries due to landmines and unexploded ordnance in Afghanistan from 2002 to 2006 reported that they result in death and injury in children and adults in high numbers (Bilukha, Brennan and Anderson 2007). This is in contrast with other conflict affected territories such as Chechnya, where the number of injured subsided rapidly after the end of active fighting (Bilukha et al 2006).

A study that investigated musculoskeletal impairment in Rwanda found that although overall prevalence was relatively high, few cases appeared to be the result of the 1994 war or related violence. A total of 8,368 people were enumerated. Of these, 6,757 were available for screening and examination (80.8%). 352 people were diagnosed with musculoskeletal impairment, indicating a prevalence of 5.2%. From self-reporting and physiotherapist's assessment 106 cases, or 30.6%, were classified as resulting from trauma. Of these, 14 people (13.2%) reported that their trauma-related musculoskeletal impairment occurred during the 1990–1994 war. A further 7 (6.6%) people reported that their trauma-related musculoskeletal impairment occurred during the violent episodes that preceded and followed the war, giving an overall prevalence of

trauma-related musculoskeletal impairment related to the 1990–1994 war of 0.3% (Kuper et al 2009).

The impact of conflict on disability appears to be very contextual, with research from different conflicts presenting differing conclusions. The evidence suggests conflicts involving ordinance appear to have more of an impact on disability prevalence.

6. Links between disability prevalence, chronic illness and non-communicable diseases

The number of people with disabilities is growing in part due to global increase in chronic health conditions associated with disability. Chronic diseases are estimated to account for 66.5% of all years lived with disability in low-income and middle income countries (WHO & World Bank 2011). A growing body of evidence indicates shifting risk factors for different age and socioeconomic groups, with the prevalence of chronic conditions increasing. The increase in diabetes, cardiovascular diseases (heart disease and stroke), mental disorders, cancer, and respiratory illnesses, observed in all parts of the world, will have a profound effect on disability. It is projected that there will continue to be large increases in non-communicable disease related disabilities in developing regions. This upward trend is caused by population ageing, reduction in infectious conditions, lower fertility, and changing lifestyles related to tobacco, alcohol, diet, and physical activity (WHO & World Bank 2011).

In high income countries, a general trend has been less smoking, lower cholesterol and blood pressure, and increased physical activity. However, the prevalence of obesity and diabetes has been increasing. To the extent to which these factors are causally associated with dementia, one would expect to see corresponding changes in dementia incidence. In many low and middle income countries, the trends in cardiovascular health among older people are in an adverse direction, with a pattern of increasing stroke, and ischaemic heart disease morbidity and mortality, linked to an epidemic of obesity, and increasing blood pressure levels. This could result in upward trends in the incidence and prevalence of dementia in low and middle income contexts (Prince et al. 2015).

The WHO (2016) estimate that by 2014, the number of adults living with diabetes was 422 million, a figure that had almost quadrupled since 1980. The increase in prevalence reflects an increase in associated risk factors such as being overweight or obese. In recent years diabetes prevalence has risen faster in low and middle income countries than in high income countries. Diabetic retinopathy is an important cause of blindness. A study from 2012 reported that the prevalence of any retinopathy in persons with diabetes was 35% while proliferative (vision-threatening) retinopathy was 7%. Globally there are approximately 93 million people with diabetic retinopathy, of these 17 million have proliferative diabetic retinopathy (Yau et al 2012).

Diabetes can also lead to lower limb amputation and several other long-term consequences that impact significantly on quality of life. There are no global estimates of diabetes-related lower-extremity amputations (WHO 2016). Data from high income countries suggest a 40% to 60% reduction in diabetes linked amputations in the past 10–15 years (Moxey et al 2011). Most available data is from high income countries and no estimates exist for lower or middle income countries. Prevalence, incidence and trends have been shown to vary hugely between countries (WHO 2016).

Cerebral palsy is a common cause of childhood physical disability. A systematic review and meta-analysis on cerebral palsy reported the prevalence to be 2.11 per 1000 live births. The overall prevalence was found to be constant in recent years despite increased survival of at-risk preterm infants. Of the 49 studies selected for review, the majority were focused on high income contexts (Oskoui et al 2013).

In 2015, 46.8 million people worldwide were known to live with dementia. It is predicted that this number will almost double every 20 years. It is estimated that this number will increase to 131.5 million by 2050. Much of the increase will disproportionately affect people living in low and middle income contexts. In 2015, 58% of all people with dementia live in lower and middle income countries. It is estimated that this figure will rise to 63% in 2030 and 68% in 2050. This shift is explained by rising life expectancy, which is associated with increased prevalence of dementia. Between 2015 and 2050, the number of older people living in higher income countries is forecast to increase by just 56%, compared with 138% in upper middle income countries, 185% in lower middle income countries, and by 239% in low income countries. Between 2015 and 2050, the number of people living with dementia in high income countries will increase by 116%, compared to a 227% increase in upper middle income countries, 223% in lower middle income countries, and 264% in low income countries. In addition to the impact of an increasingly ageing population, people living in low and middle income contexts may have fewer economic and human professional resources to care for older populations (Prince et al. 2015).

7. Trends and prevalence of mental health related disabilities

Disability prevalence increasing is linked to a global increase in mental illness (WHO & World Bank 2011). An analysis of the Global Burden of Disease study indicated that mental and substance use disorders was one of the major drivers of increases to YLDs between 1990 and 2013 (Vos et al 2013).

A review of WHO World Mental Health surveys on the global burden of mental disorders for 28 countries found that mental disorders are commonly occurring in many contexts. Prevalence estimates of 12-month serious mental illness were found to be 4–6.8% in half the countries, 2.3–3.6% in one-fourth, and 0.8–1.9% in one-fourth. Many mental disorders were reported to begin in childhood-adolescence and have significant adverse effects on subsequent transitions. Mental disorders are common and often seriously impairing in many countries throughout the world (Kessler et al 2009).

In 2010, mental and substance use disorders accounted for 183.9 million DALYs, (7.4% of all DALYs worldwide). Such disorders accounted for 175.3 million YLDs (22.9% of all YLDs). Mental and substance use disorders were found to be the leading cause of YLDs worldwide. Depressive disorders accounted for 40.5% (of DALYs caused by mental and substance use disorders, with anxiety disorders accounting for 14.6%, illicit drug use disorders for 10.9%, alcohol use disorders for 9.6%, schizophrenia for 7.4%, bipolar disorder for 7.0%, pervasive developmental disorders for 4.2%, childhood behavioural disorders for 3.4%, and eating disorders for 1.2%. DALYs varied by age and sex, with the highest proportion of total DALYs occurring in people aged 10–29 years. The burden of mental and substance use disorders increased by 37.6% between 1990 and 2010, which for most disorders was driven by population growth and ageing (Whiteford et al 2013).

Mental health conditions will affect one in four people worldwide in their lifetime. Poor mental health can lead to morbidity and mortality, low productivity, social unrest, poverty, inequality, dropout from education, high unemployment, and delays in recovery and reconstruction. In developing countries, 80% of persons with serious mental disorders do not receive appropriate treatment. Disaster-affected populations frequently experience immense mental and psychosocial suffering. Mental and emotional well-being are key factors in recovery and reconciliation after conflicts and wars and are fundamental to the promotion of peace and security (Tsutsumi, Izutsu and Ito 2015).

8. The trends and prevalence of disability in terms of age and sex

Age

Almost every human will at some stage in their lives be temporarily or permanently impaired. Those who survive to old age will experience increasing difficulties in functioning (WHO & World Bank 2011). The number of people with disabilities is growing as populations are ageing and older people have a higher risk of disability (WHO & World Bank 2011). Data from the World Health Survey (2002-2004) suggests that disability prevalence stands at 12% among working age adults and 39% among the elderly (Mitra and Sambamoorthi 2014).

As discussed earlier, the impact of natural disasters, such as the Haitian earthquake, on disability prevalence has been shown to be not as relevant as age. Disability was found to be common with increasing age, with the leading cause being communicable/non-communicable diseases. Disability prevalence was relatively low up until the age of 40, at which point it increased dramatically with almost one in four people aged 60 years and older having a disability (Danquah et al 2015).

For visual disabilities, age is a major driver. As of 2015, functional presbyopia is known to affect 80% of people aged 35 years and older globally. The estimated number of blind people increased by 17.6%, from 30.6 million people in 1990 to 36 million people in 2015. This change can be explained by population growth (38.4%), population ageing (34.6%), and reduction in age-specific prevalence (-36.7%). The number of people with visual impairment also increased, from 159.9 million in 1990 to 216.6 million cases in 2015. These results indicate that there is an ongoing reduction in the age-standardised prevalence of blindness and visual impairment. However, the growth and ageing of the world's population is causing a substantial increase in vision related disability (Bourne et al 2017).

With regards to hearing loss, age is still a factor, but less so than with vision. According to WHO and CBM (2013), 360 million people live with disabling hearing loss worldwide, equating to 15% of the world's adult population. Approximately 25% of people with hearing loss are aged above 65 years.

A study into injuries caused by landmines and unexploded ordnance in Afghanistan reported that of the 5,471 individuals injured or killed, 47.2% were among children younger than 18 years. Children were more likely to sustain upper limb amputation (24.3%) compared with adults (14.8%), whereas a higher proportion of injured adults (25.5%) than children (11.5%) sustained lower limb amputation (Bilukha, Brennan and Anderson 2007). An earlier study of the impact of landmines and unexploded ordnance in Chechnya reported that from the 3,021 individuals

included in the study, 26% of reported injuries were in children under 18 years of age. Of those injured, 23% died as a result of the accident. Children were more likely to be injured by unexploded ordnance and to sustain upper body injury and upper limb amputations compared with adults (Bilukha et al 2006).

With regards to understanding other factors driving disability in children, it should be understood that measuring child disability is challenging, as it can be difficult to distinguish limitations from variations in development. Data collection is further complicated by the varying nature and severity of disabilities, together with the need to apply age-specific definitions and measures. The poor quality of data on child disability is caused by a limited understanding of what disability is, stigma and insufficient investment in improving measurement. Estimates of disability prevalence vary depending on definition, with narrow, medical definitions being likely to result in lower estimates than broader ones that take into account social barriers to functioning and participation (Aslam 2013).

Data on child disability is still limited. A paper by Cappa, Petrowski and Njelesani (2015) describes the scope and content of data collection instruments on child disability. They found that there is a lack of consistent definitions and measures of disability, which contribute to major challenges in producing reliable and comparable statistics. The measurement of childhood disability must be harmonised in order to produce estimates that are reliable, valid and internationally comparable. Without data on disability, it is difficult to interpret prevalence of disability. Such data can be used to inform governments and the international development community on appropriate policy and programmatic responses to meet the rights of children with disabilities.

Sex

In general, women have a higher prevalence of disability than men (WHO & World Bank 2011; Mitra and Sambamoorthi 2014). However, there is some variation depending on disability type and context. For example, blindness and visual impairment affects more women than men. A recent systematic review and meta-analysis found that globally, prevalence of blindness is approximately 0.48%, of which 56% were female. In addition, the prevalence of severe visual impairment was 2.95% (55% female), and 2.57% had mild visual impairment (54% were female) (Bourne et al 2017). However, the reverse is true for hearing loss, with 183 million (56%) men male and 145 million (44%) women suffering disabling hearing loss (WHO and CBM 2013).

Disability caused by conflict has a greater impact on men than women. Of the analysed 5,471 injuries caused by landmines and unexploded ordnance in Afghanistan, 91.3% of reported injuries were among males (Bilukha, Brennan and Anderson 2007). The study on landmines and unexploded ordnance in Chechnya reported that 81% of reported injuries were in males (Bilukha et al 2006).

For some disabilities, such as dementia, projections assume that gender specific prevalence will not vary over time, with population ageing driving projected increases. However, future prevalence may be affected by changing incidence and disease duration (Prince et al. 2015).

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