

## **CHAPTER TWO: PREVALENCE, INCIDENCE AND CAUSES OF DISABILITY**

The calculations in this chapter of the prevalence, incidence, and causes of disability have been limited to those disabling conditions for which there is a known effective technology. In Chapter Three, the statistics are translated into requirements for services, interventions, activities and opportunities concerning disabled people in the developing countries. The requirements thus quantified can be used for resource planning, e.g. of budgets and personnel.

In the past, many organisations have used the estimated numbers of disabled people in the developing countries for the purposes of raising awareness of a large-scale problem and as a justification for fund-raising. The numbers given here can also be used for such aims, with the understanding that, at each turn of the calculations, certain qualifications are added. This means they are to be used with a great deal of caution. As we have noted, disability is not a well-defined condition, and there are many terminological and conceptual difficulties. Moreover, the available statistics from the developing countries are not very reliable, and more "hard data" are required before more accurate conclusions can be drawn. Also, to the same extent as health conditions vary from country to country, disabled people's needs will differ from one country to the next.

### ***1. PROJECTED GROWTH OF THE WORLD POPULATION***

Disability is a global phenomenon of huge proportions. Before estimating its magnitude, an account will be given of the projected development of the world population (Table 2.1<sup>1</sup>).

**Table 2.1: World population, as projected (medium-variant) by United Nations, 2000-2035**

<b>POPULATION IN MILLIONS</b>			
<b>Year</b>	<b>In more developed regions</b>	<b>In less developed regions</b>	<b>Total</b>
2000	1,187	4,904	6,091
2005	1,197	5,293	6,491
2010	1,206	5,684	6,890
2015	1,214	6,072	7,286
2020	1,219	6,458	7,672
2025	1,221	6,819	8,039
2030	1,212	7,159	8,371
2035	1,201	7,468	8,669

The world population is growing rapidly: by about 40 per cent from 2000 to 2035. The growth, however, is uneven. In the more developed regions, there will be no increase, whereas in the less developed regions it is forecast at about 50 per cent. The increase is most pronounced in the older age groups. (Table 2.2). As disability is more common among the elderly, this rapid increase of the population aged 65 and above will have clear implications for the future prevalence of disability.

**Table 2.2: Population in less developed regions. Projection by age groups.**

AGE GROUP	POPULATION IN MILLIONS		GROWTH
	2000	2035	
0 - 4	555	583	+ 5%
5 - 14	1,052	1,170	+ 11%
15 - 29	1,326	1,704	+ 29%
30 - 64	1,724	3,211	+ 86%
65+	247	800	+ 224%
<b>TOTAL</b>	<b>4,904</b>	<b>7,468</b>	<b>+ 52%</b>

## 2. ESTIMATES OF THE PREVALENCE OF DISABILITY

Several global estimates of the prevalence of disability have been made in the past. The most often cited is the one made by the author in 1974, which was published by WHO in 1976.<sup>2</sup> This estimate - 10 per cent of the world population - was based on calculations of disability rates resulting from diseases, trauma, malnutrition, genetic causes, etc., available at that time. These included a high proportion of people with slight and with reversible disabilities, such as those caused by malnutrition.

Since then, a large number of surveys and studies have been made. The results of these surveys from 55 different countries vary dramatically, ranging from 0.2 per cent of the population to 21 per cent.

There are a number of problems related to these studies<sup>3</sup>. The magnitude of the variance is more a reflection of survey methods used than the actual number of disabled in the various countries. It illustrates the urgency of standardising disability definitions and survey technology.

In this context I have chosen to reproduce a few data taken from some interesting surveys, one African, one American, one Asian, and one European. The results are shown in Table 2.3.<sup>5</sup> The British study was carried out on a representative sample of the population in 1985. The Canadian one similarly builds on a representative sample and took place in 1986. The Chinese study has a sample of 1.5 million people, and it was carried out in 1987. For comparison, I am also reproducing the results of a population census in Mali in 1976.

**Table 2.3** Disability prevalence rates by age groups, in Canada (1986), China (1987), Great Britain (1985) and Mali (1976), and a proposed global operative rate for calculating the prevalence of persons with moderate and severe disability.

PREVALENCE OF DISABILITY, PER CENT OF POPULATION							
AGE GROUPS	CANADA		CHINA	GREAT BRITAIN		MALI	GLOBAL OPERATIVE RATE, MODERATE & SEVERE DISABILITY
	Total	Moderate & severe	Moderate & severe	Total	Moderate & severe	Moderate & severe	
0 - 4	3.3	0.7	1.5	2.1	1.6	0.2	1.3
5 - 9	5.7	1.7	2.9	3.5	3.2	0.9	2.5
10 - 14	6.4	1.8	3.5	3.5	3.3	1.2	2.7
15 - 19	4.0	1.4	2.3	2.1	1.6	1.5	1.9
20 - 24	4.7	1.6	2.3	2.7	2.1	2.2	2.0
25 - 29	5.4	2.0	2.5	3.1		2.6	2.3
30 - 34	7.8	3.4	2.9	4.0	2.8	3.5	3.2
35 - 39	8.6	3.8	3.6	4.4		4.2	3.7
40 - 44	10.5	4.5	4.3	5.9	4.3	5.4	4.4
45 - 49	12.7	6.8	4.8	7.9		6.4	5.8
50 - 54	17.3	9.3	6.0	10.6	8.1	7.7	7.7
55 - 59	22.6	13.2	8.4	15.5		9.0	10.8
60 - 64	30.5	18.0	12.1	20.5	13.9	11.0	15.1
65 - 69	34.1	19.0	17.6	27.5		13.0	18.3
70 - 74	40.9	25.2	25.8	34.2	25.3	15.2	25.5
75 - 79	49.1	37.7	37.5	46.6		17.4	37.6
80 - 84	73.7	58.5	49.3	61.6	51.6	17.8	56.0
85+			58.6	77.9		20.5	
<b>Average for the entire population</b>	13.3	7.4	4.8	11.6	8.6	3.0	

As can be seen from Table 2.3, there appear to be large differences in the "all disability" prevalence rates between Canada and Great Britain on the one hand and China and Mali on the other. This is not surprising, one reason being that different survey methods were used. But there are also large discrepancies regarding age composition and health situation.

For instance, the China data mainly include people with moderate and severe disability and underestimate some large groups of people with chronic non-communicable somatic disease – such as rheumatic back pain and joint conditions. Half of the disability seen in Canada is mild or slight. If we compare the rate of the moderate and severe disability in Canada with the one observed in China, the differences in each five-year group are small.

The total disability prevalence in China is 4.8 per cent. This relatively low figure is partly due to the present age composition of the population. If we were to simulate a situation where the Chinese population had the same age distribution as the one we find in the industrialised countries, the average total prevalence in China would come to 7.7 per cent.

The British study is based on a questionnaire and types of examinations that are different from those applied in the Canada and China surveys. The prevalence is 11.6 per cent; one quarter represents slight disability. Moderate and severe disability (severity categories 3-10) total 8.6 per cent. In this study, as in the others, the prevalence decreases from age group 10 to 14 to group 15 to 19. This might be attributed to a change of disability recognition at the end of school age. In the age groups 30 - 69, the Chinese rates are the lowest of the three countries shown in the table. This could be explained by a higher mortality rate before the age of 30. In the groups aged 70 and above, differences are small.

Comparing the Mali census (1976) with the others, one notices some differences. The prevalence of disability in children is lower; this can be explained by the fact that disability is not a "diagnosis" made early in life in Mali. Parents believe their child to be sick and to recover sooner or later, which is why the label "disabled" is not used. Another likely reason for this low prevalence is an excessive mortality. In 1976, the under-five-mortality rate was estimated to be about 32 per cent, and it is likely that a large proportion of disabled children had died early<sup>6</sup>. In the age group 15 to 64, the prevalence numbers do not differ much from those for moderate and severe disability in the other countries. After age 65, few disabled Malians survive, and disabling symptoms are seen as "normal in elderly people." Hence an elderly family member is not always perceived as disabled, even if afflicted with severe functional limitations and activity restrictions leading to total dependence on others.

In the last column of Table 2.3, I have proposed a "global operative prevalence rate of moderate and severe disability." (See diagram in Fig. 2.1.) The rate shown is based on observations and attempts to identify a compromise between the individual prevalence rate of the four countries included in the Figure. The justification is that the differences are not great, looking at the prevalence in each 5-year group. This assumed rate will be used for all the calculations of prevalence of disability and needs of rehabilitation made in this book. For each country, this prevalence can be calculated individually, based on the age composition.

This technique may be called "rapid calculation of disability prevalence". Using this assumed rate and the UN population statistics for 2000, we will arrive at a global estimate of the prevalence rate of moderate and severe disability of 5.5 per cent as shown in Table 2.4. This is an aggregate of prevalence of 8.5 per cent for the more developed regions and of 4.8 per cent for the less developed regions.

This brings us to the total estimate for 2000 of 335 million moderately and severely disabled people in the world, of whom about 101 million (30%) live in the more developed regions and 234 million (70%) live in the less developed ones. For age composition see Table 2.8.

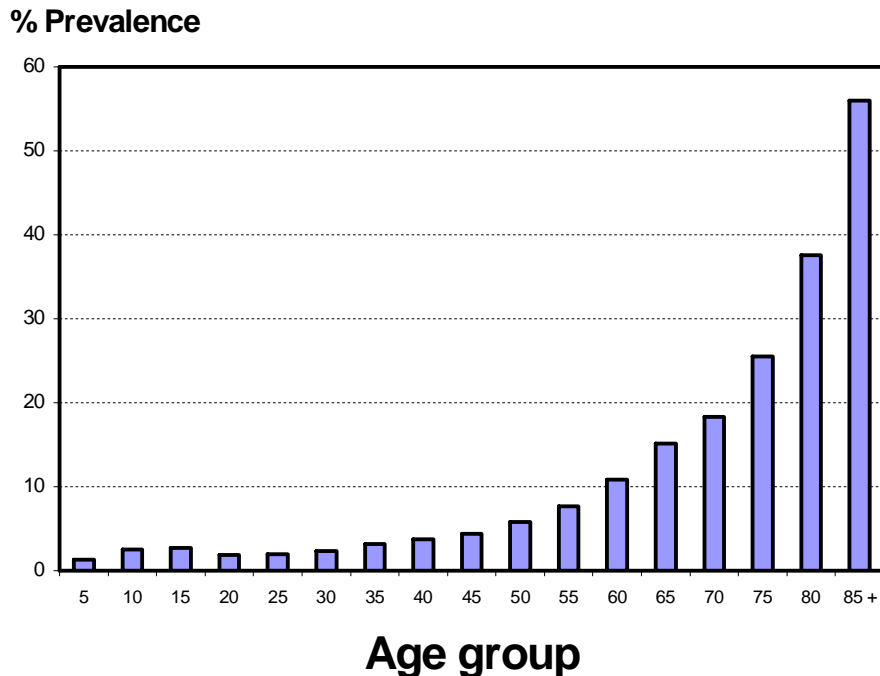
It would be reasonable to assume that most of the moderately and severely disabled people are dependent on others physically, psychologically, socially, or economically. Most of them live below the poverty level.

The figures above obviously do not include temporary or short-term disability caused by curable diseases or reversible conditions, or by terminal disability associated with severe disease (unless such disease is slow and degenerative). If such disability had been included, the prevalence of disabled people would increase considerably.

In the developing countries, there are large numbers of people who have a long lasting or a recurrent disability resulting, for instance, from bacterial or parasitic diseases, cancer and HIV infection. These

people need care, but only a limited number of them could be expected to join a rehabilitation programme. It is for this reason that they have not been included in the above calculations. In most of the cases indicated in Table 2.4, the underlying condition is chronic, long lasting or even lifelong. This does not mean that the dependency associated with the given disability must remain lifelong. For a large proportion of disabled people we are able, through rehabilitation, to eliminate or to reduce the dependency. It is clear that more accurate estimates would have been possible had there been access to more high quality surveys.

Figure 2.1



**Table 2.4: Global estimate of prevalence of moderately and severely disabled people, based on the UN population projections for 2000, and on the rapid calculation of disability prevalence method.**

	<b>MORE DEVELOPED REGIONS</b>	<b>LESS DEVELOPED REGIONS</b>	<b>TOTAL</b>
<b>Total population (millions)</b>	1,187	4,904	6,091
<b>Prevalence of moderate &amp; severe disability</b>	8.5%	4.8%	5.5%
<b>Number of moderately &amp; severely disabled people (millions)</b>	101	234	335

Before concluding this part of the estimations, it is important to add that people with slight disabilities too may need the help of a rehabilitation programme, particularly ability/vocational training and jobs. In fact, most such rehabilitation is targeted at this group of disabled people. For the purposes of calculating such needs, I will assume that those with slight disability are equivalent to half of the group with moderate and severe disability.<sup>7</sup>

**Table 2.5: Estimated age-related annual incidence of moderate and severe disability in the less developed regions, based on data available from China.**

ANNUAL INCIDENCE			
AGE GROUP	INCIDENCE RATE (CHINA, 1987)	CORRESPONDING ANNUAL INCIDENCE (MILLIONS)	
YEARS		2000	2035
0 - 4	0.28	1.6	1.7
5 - 9	0.51	2.8	3.2
10 - 14	0.64	3.4	3.9
15 - 19	0.44	2.1	2.7
20 - 24	0.43	1.8	2.5
25 - 29	0.49	2.1	2.9
30 - 34	0.57	2.3	3.2
35 - 39	0.73	2.5	4.1
40 - 44	0.88	2.5	4.6
45 - 49	1.03	2.5	5.1
50 - 54	1.32	2.5	5.8
55 - 59	1.89	2.8	7.3
60 - 64	2.81	3.6	10.2
65 - 69	4.25	4.3	13.2
70 - 74	6.59	4.7	15.2
75 - 79	10.23	4.5	15.4
80+	21.00	6.7	26.5
<b>TOTAL</b>		49.7	126.5

### 3. INCIDENCE OF DISABILITY

There are no wide-range studies or research regarding directly observed incidence of disability. This is easy to understand. Among children, for example, it might be difficult to identify a disability such as cerebral palsy, deafness, or mental retardation before the child is a few months old, at least. Many disabled infants and children die young, without having been recognised as disabled by the family, or by a medically competent person. Even if a diagnosis has been made, the family may not have been told. In some developing countries, where the infant mortality rate has been very high, parents do not give the child a name until it is one year old. This makes inquiries into incidence and mortality among disabled infants and children even more difficult.

At old age, many people suffering from a terminal disease have activity restrictions during a period before they die. For some this disability period lasts only a few days or weeks, for others it is longer. It is not easy to draw a line and to decide who will be counted as a "newly disabled" person and will consequently be included in the annual incidence. For other people, the experience is that disability sets in gradually and may be seen as "normal ageing," "wear and tear," and the point at which a person enters

the group of moderately and severely disabled people is not easy to decide.

This explains why the estimates of annual incidence of disability are based on indirect methods. Relevant data have been derived only from prevalence rates and calculations of active (disability-free) life expectancy.<sup>8</sup> In Table 2.5, I have only reproduced data from China<sup>9</sup>. Projecting these data to all developing countries, we estimate that the number of people who became moderately or severely disabled during 2000 will be about 50 million. This "annual incidence" is estimated to increase to about 126 million in 2035<sup>10</sup>.

The total annual incidence estimates made most likely under-represent the truth. Research is needed to establish reliable data. However, the calculations made here serve the purpose of setting targets for provision of rehabilitation services in the developing countries. A certain proportion of the newly disabled will need such services. Most of the others will need care, help and support.

#### 4. GENDER AND DISABILITY

The incidence of disability is not the same in males and females. Certain health conditions are more frequent in one of the sexes. For instance, there is a slightly higher incidence of mental retardation in males; they have more accidents, certain genetic disorders, etc. Females have disabilities caused by motherhood (see Box 3.2), osteoporosis, etc. In many countries, where women survive longer than men do, the total prevalence of disability is most often higher in women. But for most major causes of disability, there is no significant difference in disability incidence. Examples are polio, cataract, ear and eye infections.

The survival of girls and women, who are disabled, may be influenced by neglect. Studies in several countries in South Asia indicate a large gender difference in disability prevalence; Table 2.6 shows an example<sup>11</sup>.

**Table 2.6: Gender differences in disability prevalence**

Type of disability	Male	Female	Total
Blind	142	97	239
Vision impairment	163	98	261
Orthop. impairment	1086	518	1604
Deaf	371	177	548
Mental retardation	116	62	178
<b>Total</b>	<b>1878</b>	<b>952</b>	<b>2830</b>

This Table reflects the degree of neglect of disabled females and the excessive mortality that is the result.

#### 5. ESTIMATES OF CAUSES OF DISABILITY

My 1974 estimate that 10 per cent of the world population was disabled needs to be reviewed.

Three factors have led me to revise the calculations downward. The first one concerns malnutrition. The experts consulted in 1974/75 saw protein-caloric malnutrition as causing disability in about 100 million people, mostly children. Their views have changed, and this condition is now seen as a reversible impairment. It is not considered to cause chronic disability, except for some less frequent conditions such as xerophthalmia and cretinism, which affect some seven to ten million people. This change of view alone would have reduced the global prevalence rate calculated in 1974/75 from about 10 per cent to about 7.5 per cent.

The second factor is that, in 1974/75, the duration of life after the occurrence of a disability (for a person in a developing country) was overestimated, and this reduces the estimated prevalence further.

The third factor is that in the 10 per cent estimate were included a certain proportion of slightly disabled people. In view of the sometimes unclear borderline between ability/disability, and the fact that slight disabilities less often lead to needs for rehabilitation services, I am proposing that we confine ourselves to identifying those, who are moderately and severely disabled.

Current estimates based on causes of moderate and severe disability can be seen in Table 2.7. The figure draws on a series of inquiries made in all relevant divisions and units of WHO. It is based on a large number of data and estimates from scientific publications, professional observations and field studies.

**Table 2.7: Causes of disability and estimated prevalence of moderately and severely disabled people in the world, estimates for 1998**

<b>CAUSES OF DISABILITY</b>	<b>GLOBAL SUGGESTED RANGES OF ESTIMATES OF THE PREVALENCE OF MODERATELY &amp; SEVERELY DISABLED PEOPLE (WORLD POPULATION 6,000 MILLION) MILLIONS</b>
<b>Congenital or perinatal disturbances</b>	
Mental retardation	20 - 30
Somatic hereditary defects	10 - 25
Non-genetic disorders	15 - 20
<b>Communicable diseases</b>	
Poliomyelitis	5 - 10
Trachoma	8 - 10
Leprosy	3 - 4
Other communicable diseases	40 - 50
<b>Non-communicable somatic disease</b>	80 - 100
<b>Functional psychiatric disturbances</b>	20 - 25
<b>Alcoholism and drug abuse</b>	30 - 35
<b>Trauma/Injury</b>	
Traffic accidents	20 - 25
Occupational accidents	10 - 12
Home accidents	15 - 20
Other	2 - 3
<b>Malnutrition</b>	7 - 10
<b>Other</b>	2 - 3
<b>ESTIMATED TOTAL</b>	<b>300 - 350</b>

The Table illustrates<sup>12</sup> an attempt to account for the causes of disability on a worldwide basis. There are four major contributors to disability: congenital or perinatal disturbances (15-20 per cent), communicable diseases (about 20 per cent), non-communicable somatic and mental conditions (40 - 45 per cent), and trauma/injury (about 15 per cent). Some trauma is related to violence, and this may result in later physical and mental disability (Box 2.1<sup>13</sup>).

These numbers should be taken with caution. Many derive from limited studies<sup>14</sup> on the prevalence of various chronic conditions, from extrapolations and from educated guesses. They do, however, give an idea of the large number of factors that contribute to disability.

### BOX 2.1 VIOLENCE AS A CAUSE OF DISABILITY

Many countries have experienced long periods of independence and civil wars, unrest, tribal/clan wars, etc. These have resulted in casualties many suffering a life long physical disability, such as an estimated 30,000 amputated soldiers in Angola. But mental health complications caused by violence are even more common. Severe psychiatric diseases or disturbance is seen among many that have either participated or lived through a war. Examples to include are the systematic rapes of women in Bosnia. Violence in the post-war years tends to remain elevated, often for 30 to 40 years.

Also common in many countries is violence within the community: murder, attempted murder, as well as armed fights (guns, knives, other weapons) are frequent. Some of this is related to family conflicts combined with alcohol and drug abuse. In many countries, 20 per cent to 75 per cent of women report being regularly battered by their husbands.

Incest and rape are common causes of pregnancy among girl's aged 12 to 16. In a maternity ward in a Latin American capital, 95 per cent of the girls admitted were pregnant for these reasons; a study from another capital on the same continent showed the proportion to be 90 per cent. Though underdiagnosed or hidden, child abuse is frequent. According to some reports, between ten percent and thirty per cent of all children are exposed to intense, continuous battering. Severe, but less frequent abuse affects another 50 per cent of children in a number of studies undertaken.

Added to the violence experienced in the family and the community is the one organised by States through their police, army or security units.

An UNICEF study from Somalia undertaken in 1988 covered four district hospitals in a particular region. Each hospital served about 100,000 people. The author of the report states that "it was surprising to find that in the hospital records dating two years back, the only patients admitted for treatment in the hospital consisted of hundreds of cases listed as 'wounds' (dhawac). The hospital staff described these 'wounds' as resulting from domestic violence and other forms of community fighting. Other patients coming to the hospital for various health conditions had not been admitted as in-patients".

Violence often leads to severe injuries and or loss of consciousness; the resultant physical and mental symptoms are often life-long and disabling.

No systematic studies have been made to assess fully the extent to which violence contributes to disability.

## 6. DISABILITY PREVALENCE: PROSPECTS

The prevalence of disability in the future will be affected by a multitude of factors. The *first factor to consider is disability prevention*.

With improved health care, interventions in the environment, etc., it is likely that the incidence of disability, especially among infants, children and adolescents, will be prevented or delayed. Such preventive efforts will take place at two levels. (See Box 2.2.) Re-examining Table 2.7, one would expect a decrease in communicable diseases and malnutrition in the developing countries – similar to the experience in the industrialised world.

### Box 2.2. DISABILITY PREVENTION

**Primary prevention** involves action taken to reduce the occurrence of conditions likely to cause disability, for example, provision of proper water and sanitation facilities; vaccination against communicable diseases; health education; proper child-rearing; improved nutrition, hygiene and physical fitness; limitation of the availability and use of alcohol, drugs and tobacco; legislation to reduce accidents and diminish occupational health hazards; better roads and vehicles; better training of drivers; effective control of drugs and toxic products that have disabling effects; education of the public aimed at diminishing trauma/injury caused by accidents; improved distribution and preparation of food; improved general level of education; measures to combat gross child neglect and abuse.

**Secondary prevention** takes place once a disabling disease or other condition is apparent, interventions can be either directed towards preventing the development of disability. Examples are: early treatment of trachoma; use of effective drugs for communicable diseases such as leprosy, tuberculosis, onchocerciasis, meningitis, eye and ear infections, and for psychiatric disease and epilepsy; early ambulation after severe disease or surgery; elimination or reduction of risk factors or of continued exposure to hazardous agents. Or, if disabilities are already present, towards attempts at reversing these through curative treatment, e.g. surgical treatment of cataract, of contractures and deformities and so on.

The action listed above under primary prevention is more or less equivalent to an entire community health development programme supplemented by multi-sectoral interventions at all levels. Secondary prevention is one of the roles of the health sectors.

Disability prevention should be seen as a concept that applies to a large number of sectors.

Rehabilitation is sometimes said to be tertiary level prevention, its objective being to overcome the difficulties experienced by a disabled person. This term will not be used here.

A reduction of the incidence by 50 per cent over, let us say, the next 20 years, would bring down the present number of disabled people (resulting from these causes) from an estimated 73 (63-84) million to about 50 million, factoring in a 36 per cent increase in population in the developing countries. Thus, prevention at this level of success concerns about 10-15 million people in a decade. Primary or secondary prevention will have minor effects on the other causes of disability mentioned in Table 2.7. Disability as a result of congenital or hereditary conditions and non-communicable diseases as well as mental health conditions will most likely remain at that level. Disability caused by trauma/injury is on the rise. Interventions to "cure" disability are on the rise. These include cataract surgery, drug treatment of leprosy, onchocerciasis and other diseases, and new techniques to correct genetic deficiencies.

The conclusion is that disability prevention will slowly change the "disability panorama" in the developing countries. The results of effective prevention will not lead to a reduction in total prevalence rates, as other and more dominating causes (such as non-communicable disease and trauma) will cause an increase.

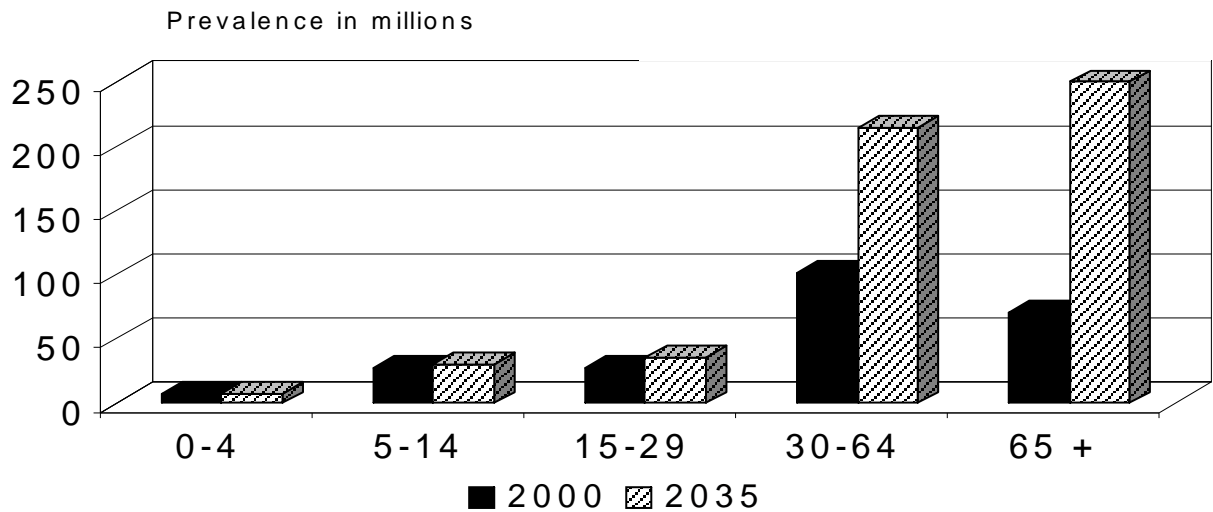
The *second factor* is related to the changes in the *age composition*. It is likely that the expected survival rate will continue to increase quite considerably in the less developed regions. Fewer young people will die, and the proportion of elderly (+65 years) will more than triple between 2000 and 2035. Children and young disabled people, who now have an excessive mortality rate, will live much longer and so will the elderly disabled. This will eventually increase the prevalence of disability quite considerably, as illustrated in Table 2.8. and Fig 2.3.

**Table 2.8: Expected increase in the prevalence of moderately and severely disabled people, on the assumption of no change other than in age composition**

AGE GROUP	LESS DEVELOPED REGIONS MILLION DISABLED PEOPLE		CHANGE %	MORE DEVELOPED REGIONS MILLION DISABLED PEOPLE		CHANGE %
	2000	2035		2000	2035	
0 - 4	7,2	7,6	+ 5	0.86	0.85	- 1
5 - 14	27,4	30,4	+ 11	3.93	3.40	- 14
15 - 29	27,3	35,1	+ 29	5.11	4.41	- 14
30 - 64	101,4	214,8	+ 112	36.94	38,99	+6
65+	70,6	237,0	+ 236	54.28	94,26	+74
<b>TOTAL/AVG</b>	233,9	524,9	+ 124	101.08	141,91	+40
<b>% of total population</b>	4.8	7,0	+ 46	8.5	11.8	+ 39

Table 2.8 shows that the group of moderately and severely disabled children (aged 0 to 14) increases by not more than 3 million or about 9 per cent; that of young people (15 to 29) by 29 per cent, the adults (30 to 64) by 112 per cent; and the group aged 65 and over by 236 per cent. The average estimated increase from year 2000 to 2035 is 124 per cent, i.e. from some 234 million to 524 million moderately and disabled people. At that time the prevalence of moderate and severe disability will be very close to what it is now in the industrialised countries.

Changes are also seen in the more developed regions. Projections for these countries (under the same assumptions) show that the prevalence in 2035 of "moderate and severe disability" will be 11.8 per cent.

**Figure 2.3****Expected increase in the prevalence of moderately and severely disabled people from 2000 to 2035**

The *third factor* concerns the influences of the *environment*.

The environment in the developing countries will undergo a variety of changes in the future. These will include increased urbanisation, more traffic, industrial development (causing pollution and injuries), increased use of hazardous chemical substances and of machinery in agriculture, deterioration of air, water and sanitation systems. All these are likely to contribute to an increased incidence of disability.

On the other hand, it is likely that some other changes may decrease the occurrence or severity of disability; e.g. better education and health, a lower pregnancy rate, improved child-rearing, less poverty, improved housing, shorter working hours and better communications.

Based on these three factors, we may now make a forecast for the next 35 years. In the less developed regions, where, in 2000, we have about 4.8 per cent moderately or severely disabled people, we will - some 35 years later - have 7.0 per cent.

To sum up the positive effects of prevention will be more than offset by many other factors that will influence the incidence, and as people live longer the prevalence will tend to go up. If one combines the effects of prevention (for communicable diseases and malnutrition) with the effects of a changed age distribution, it is very likely that the number of disabled people in the age groups under 30 will remain largely unchanged. The increase of such people in the age groups above 30 will be considerable, and in the group above 65 it will be dramatic. By the year 2035, there will be at least 540 million moderately and severely disabled people in the developing countries. Compared with today the prevalence will **more than double in one generation**.

## 7. CONCLUSION

The above text has shown that it is difficult to estimate the prevalence, the incidence and the causes of disability. The fact that there are few reliable studies and facts reflect the low priority given to people

with disabilities in all sectors. Estimates like those made above are to a large extent based on educated guesses and experience. To better plan for the future, a clear set of internationally agreed disability definitions is needed, the survey technology has to be standardised, and more adequate scientific studies should be done.

When this has been achieved, the above predictions should be revised. In the meantime, it would be reasonable to assume that the prevalence of moderately and severely disabled people in the less developed regions is

**in 2000 about 234 million, to increase by 2035 to about 525 million.**

The corresponding global numbers are

**in 2000 about 335 million, to increase by 2035 to about 667 million.**

**Close to ten million severely or moderately disabled people are added each year to the total global figure - or about 25,000 a day.**

**These figures point to the urgency of seeking solutions as to how best to provide the necessary services for disabled people, in a system that also gives them adequate representation and equal opportunities, and that promotes their human rights.**

## COMMENTS AND REFERENCES

<sup>1</sup> Source: Demographic Database from the United Nations Population Division, New York, USA, 1996. The terms "more developed regions" and "less developed regions" are taken from this and other UN publications. In this book, we mostly use the equivalent terms of "industrialised countries" and "developing countries".

<sup>2</sup> The original estimate was publicised in document A29/INF DOC/3, WHO, Geneva, Switzerland, 1976. Annex I of the document contains a very detailed review of the data existing at that time.

<sup>3</sup> A large number of these surveys and studies have been reviewed by M. Chamie, at the UN Statistical Office, New York.

- M. Chamie: Aging, Disability and Gender. *Quart.J.Int.Inst.Aging*, Vol.1, No. 5, 1991;
- Development of Statistics of Disabled Persons: Case Studies (ST/ESA/STAT/SER.Y/2), United Nations, New York, USA, 1990;
- United Nations. Disability Statistics Compendium (ST/ESA/STAT/SER.Y/4); (esp.pp.1/75), New York, USA, 1990; and
- M. Chamie: "Survey design statistics for the study of disability," *World Health Statistics Quarterly*, Vol. 42, No. 3, pp. 122-140, 1989.
- Manual for the Development of Statistical information for Disability Programme and Policies, United Nations, New York, 1996

<sup>5</sup> United Nations Statistical Office Disability Statistics Database, original data:  
Canada - Health and Activity Limitations Survey, 1986.

China - National Sampling Survey of the Handicapped, 1987.

Great Britain - Office of Population Census and Surveys of Disability in Great Britain, 1985-86.

Mali - Population census, 1976.

<sup>6</sup> cf. M.Yaqoub et al. *Acta Paediatrica* 84, 269, 1995. The authors found a cumulative incidence of severe mental retardation of 11 per 1,000 live births during the age of 2 to 24 months. The mortality of these children during the study period was 36%, all caused by respiratory infection.

<sup>7</sup> This estimate is based on several studies, (such as those mentioned in Comment 3), and on field observations using the identification technique described in TCPD, or similar methods, for instance in Mexico (Hindley-Smith);

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Somalia (Tiroler), Kerala, India (Menon and Hariharan); Karnataka, India (Action Aid); Pakistan (Finnstam, Grimby and Rashid); Philippines (Valdes).

For a review see also J.J. Arvelo: Epidemiology and rehabilitation, in (Eds. F.J. Kottke and E.A. Amate) *Clinical Advances in Physical Medicine and Rehabilitation*, Pan America Health Organisation, Washington, D.C., USA, 1991.

- <sup>8</sup> K.G. Manson, E. Stallard: *J. Gerontology, Social Sciences*, 46:170, 1991, Prevalence rates are divided by the number of expected years living disabled to give annual incidence rates for each age group.
- <sup>9</sup> These data have been provided by Mr. J.E. Dowd, Statistician, WHO, Geneva, Switzerland. His help is acknowledged with thanks.
- <sup>10</sup> One may from the incidence calculations for the developing regions notice that in 2000 there is an annual increase of 50 million persons with moderate and severe disability. The annual increase in prevalence rate is, however, 10 million. This suggests that the annual mortality is 40 million, This corresponds to 17 per cent (40 million out of 236 million) or an average survival time of 6 years. Even more worrying is that the annual incidence of disability (by year 2000) among children aged 0-14 years using the available data appears to be about 7.8 million, and for this group the forecast is only for a negligible increase of disability prevalence. These numbers lacking more adequate research-based data should be taken with caution. But they are a clear indication of excessive mortality, partly caused by the disability and partly by severe neglect. Most disabled children, for instance, die from bronchitis and diarrhoea unrelated with the disability.
- <sup>11</sup> Based on a survey carried out 1998 by Blind Men's Association, Ahmedabad, India. Compare also the "Report on the Sample Survey of Disabled Persons in Nepal, June 1981", published by the Ministry of Health in Kathmandu, shows the gender distribution (12.28% male and 5.94% female) of "lower limb disability". Almost all of this disability is caused by polio, which affects both sexes equally. This leaves but one explanation of the gender distribution: a much higher mortality among young girls than among young boys with polio. At the time of the survey, Nepal had a very high under-five mortality rate. See also Box 3.3.
- <sup>12</sup> This figure builds on information received from, and on detailed discussions with, all relevant units and divisions in WHO during 1987/88. The author acknowledges this valuable help. The malnutrition-caused disability now includes only people with consequences of specific malnutrition, such as xerophthalmia and cretinism.
- <sup>13</sup> L. Heise: *Violence, Health and Development Project*. Fact sheet from Women's Global Leadership, Rutgers University, New Brunswick, New Jersey, 1992.  
B. Helander: *Family Health Management in the Gansaxdheere District of the Bay Region, Somalia*, UNICEF, Mogadishu, Somalia, 1988.
- <sup>14</sup> For a detailed review of data on causes of disability as reported in national surveys and population censuses, see [World Health Statistics Annual](#).