influence (false-negative results) on these urine drug tests. Hand soap, which is commonly available in most public toilets, gave false-negative results for both tests.

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PREVALENCE OF CHILDHOOD DISABILITY IN RURAL KWAZULU-NATAL

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Objective. To determine the prevalence of disability in children under 10 years of age in the Manguzi subdistrict, in order to inform the development of an appropriate rehabilitation service.

Setting. Twelve areas within the rural Manguzi subdistrict of the Jozini-Uthungulu district in the far north-east of KwaZulu-Natal.

Design. A descriptive study in two stages. The first stage identified children under the age of 10 years reported with a disability. For this stage, 12 community health workers (CHWs) were trained to use a validated '10-question' screening tool with probes, adapted to include the under-2-year age group. The second stage involved confirmation of actual disability by the Manguzi rehabilitation team.

Results. A total of 2 036 children were screened. Of these children, 168 were reported with a disability giving an overall rate of 83/1 000 (95% confidence interval (CI): 71 - 95). The overall confirmed prevalence rate for children with disabilities under 10 years was 60/1 000 (95% CI: 50 - 71). The most prevalent disabilities were mild perceptual or learning disability (17/1 000), followed by cerebral palsy (10/1 000), hearing loss (10/1 000), moderate to severe perceptual disability (6/1 000) and seizure disorders (4/1 000).

Conclusion. The prevalence of disabilities among children aged under 10 years is high. This has major implications for health, rehabilitation, welfare and educational services in rural areas. These implications must be addressed in order to develop appropriate rehabilitation services for children in rural areas.

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The national Department of Health (DOH) has made services for children under the age of 6 years a priority. It has been proposed that childhood disability is an index of the health status of the child. Childhood disability is one of the major chronic conditions among children, which has major implications for the health and other needs of a community.

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Little is known about the prevalence of childhood disability in developing countries. There have been a few major contributions, including large prevalence studies in Jamaica, Bangladesh and Pakistan.[1] Durkin *et al.*[1] developed a low-cost reliable screening tool, called the '10-question' questionnaire for children aged 2 - 9 years, which covers the six disabilities, namely motor, visual, hearing, speech and cognitive disabilities as well as seizure disorders. The reported prevalence rates for childhood disability from these three countries vary from 82/1 000 in Bangladesh, to 147/1 000 in Pakistan and 152/1 000 in Jamaica. Jamaica has the highest childhood disability prevalence rate although it has a higher doctor-to-patient ratio and better immunisation coverage than the other two countries. The researchers suggest that this might be related to more children surviving childhood illnesses through better health care, with the result that there are more disabled children as a percentage of the population. In poorer countries with inadequate health services, many disabled children die in infancy.[1]

In South Africa, Irlam (J Irlam — unpublished report, 1996) and Kromberg *et al.*[2] used the '10-question' questionnaire. Irlam did a two-stage disability prevalence study of children aged 2 - 19 years in the Ntuze/Onguye area of rural KwaZulu-Natal and found a confirmed prevalence rate of 33/1 000. Kromberg *et al.*[2] did a prevalence study of children aged 2 - 9 years in the Bushbuckridge area of Mpumalanga and found an overall confirmed rate of 64/1 000. Corneljie[3] used a screen with developmental questions and found a prevalence rate of 52/1 000 for children less than 9 years in the Gelukspan area, now the North West province.

METHODS

The Manguzi Health subdistrict, an isolated rural area situated in the far north-eastern part of KwaZulu-Natal, covers an area of 2 400 square kilometres, with an estimated population of 100 000. There are an estimated 40 000 people living around the Manguzi Hospital in the town of KwaNgwanase. The rest of the population is scattered around the subdistrict, which is divided into 31 areas.

This descriptive, cross-sectional study was carried out in two stages. In the first stage 12 community health workers (CHWs) were trained to use the adapted 10-question screening tool with probes. The original questionnaire was adapted with the addition of six developmental questions to include the under-2 age group, as this is the optimal time for early intervention if there is a disability. The adapted 10-question screening tool was translated into Zulu, back into English and then again into Zulu. During the training sessions of the CHWs the questionnaire was piloted in the community to ensure that the questions were understood and the forms filled in correctly. Twelve of the 31 areas in the Manguzi subdistrict were chosen in relation to identified criteria, namely distance to the hospital, distance to the tar road and structure of the homes, thus ensuring maximum variation. Twelve unemployed CHWs visited 60 homesteads in each of these 12 areas. Guidelines for the selection of the homesteads were applied, for example visiting distant homesteads unknown to the CHWs, but there may have been selection bias. A total of 736 homesteads were visited, with 2 036 children screened.

In the second stage the rehabilitation team, consisting of two occupational therapists, one therapy assistant and one community rehabilitation facilitator, confirmed the disabilities reported by the family at accessible clinic or mobile points. A history and assessment form was used and all the children were assessed to confirm perceptual, motor, hearing, visual and speech disabilities as well as seizure disorders. During the assessment, questions were also asked about the rehabilitation service, school attendance and eligibility for the care dependency grant. All children confirmed with a disability were followed up and treated by the rehabilitation team either at the hospital or nearest clinic. At the end of the assessment each child was given a final assessment and there was feedback to the caregiver. An evaluation was also made as to the projected service needs, namely medical, educational and welfare in order to inform these different departments.

A 5% random sample ($N = 36$) of the total number of homesteads were re-tested 3 months after the initial interviews. The comparison between the initial interview by the CHWs and the repeat interviews for the 36 homesteads by a trained therapy assistant showed substantial agreement, with a Kappa score of 0.68.

The data were analysed using the Epi-Info 6 statistical programme.

RESULTS

Of the 2 036 children covered by the survey, 163 were reported with a disability, giving an overall reported prevalence rate of 83/1 000 children under 10 years (95% confidence interval (CI): 71.1 - 95.5). Five of these children could not be located, giving a follow-up rate of 97%. Of the 158 children followed up, 122 were found to have a disability, giving an overall confirmed prevalence of 60/1 000 (95% CI: 50.2 - 71.3). Fifty-three per cent of these were boys. Reported and confirmed rates for the individual disabilities are given in Table I and age-specific rates in Table II.

Disability was divided into mild, moderate and severe categories. The description of these categories was adapted from Thorburn *et al.*[4] Of the disabled children confirmed with a disability, 61% were mildly, 20% moderately and 19% severely disabled.

Each child confirmed with a disability was given a single diagnosis, although each diagnosis may represent a few impairments. For example, a child with cerebral palsy may

Table I. Overall reported and confirmed childhood disability prevalence rates in the Manguzi subdistrict

Disability	Reported prevalence rate per 1 000	Confirmed prevalence rate per 1 000
Perceptual disability	20	37
Motor	26	28
Speech	15	24
Hearing	39	20
Seizure disorder	14	9
Vision	15	2
Total	83	60

Table II. Age-specific prevalence rates per 1 000 for confirmed disability among children under 10 years in the Manguzi subdistrict

Disability	Children aged 0 - 24 months	Children aged 2 - 5 years	Children aged 6 - 9 years
Perceptual disability	3	29	67
Motor	20	29	30
Speech	10	26	27
Hearing	10	14	36
Seizure disorder	3	9	13
Vision	7	10	25
Total	20	48	63

have perceptual disability, seizure disorder and be blind. This child would therefore have a single diagnosis of cerebral palsy but have three disabilities. The most prevalent diagnosis was perceptual disability (17/1 000), followed by cerebral palsy (10/1 000), hearing loss (10/1 000), moderate to severe perceptual disability (6/1 000) and seizure disorder (4/1 000).

Discussion

CHWs were used in this study as they are chosen and trusted by their community, and are in a good position to gather reliable information. They covered an extensive area in a limited time period considering the vast distances they had to travel on foot. They found this survey physically challenging. However, it proved to be a low-cost method of screening for children with disabilities.

With regard to the 10-question screening tool, this study highlights its limitations in detecting mild perceptual disability and the need for a professional to confirm reported disability.

The overall prevalence rate of childhood disability in this study is comparable to rates for other similar rural areas in South Africa, which suggests the accuracy of this result. The reported rate compares with that found in Bangladesh. The overall confirmed childhood disability prevalence rates in this study increased with age. The reasons for this are probably related to acquired childhood illnesses, such as ear and eye infections. A similar pattern was found in Bangladesh, also due to acquired hearing, visual and intellectual disabilities.[1]

Perceptual disability is the most common confirmed disability, although these rates should be interpreted with some caution for two reasons. Firstly, there was a higher confirmed rate for perceptual disability than was reported by the families, and secondly the measurement tool (the visual motor integration test) correlates poorly with intellectual quotient (IQ) tests. The rates for perceptual disability are considered to be low and probably underreported. However, the rates for severe perceptual disability are comparable and range from 6/1 000 in this study and in Bangladesh, to 7/1 000 in Bushbuckridge. Kiely[5] confirms that severe perceptual disability remains relatively consistent across populations in both developed and developing countries whereas there is a wide discrepancy with regard to mild intellectual or perceptual disability. In Bangladesh, Islam *et al.*[6] compared the prevalence rate of mild intellectual disability between two different socio-economic groups. In the upper socio-economic group the prevalence rate was 8/1 000 and in the lower socio-economic group the rate was found to be three times higher, namely 25/1 000. Although there needs to be further research on this aspect, there is the suggestion that inadequate housing, water supply, refuse removal and lower family income contribute to the poor intellectual functioning of children. The prevalence rate of mild perceptual disability in this study (17/1 000) is comparable to Kromberg *et al.*'s[2] rate of 15/1 000. The age-specific rates for children in junior primary school (6 - 9 years) give a rate for perceptual disability of 67/1 000. Although this rate has huge implications for the education of children with special needs, it is believed by the author to be an underestimated rate, because families reported their main concerns of hearing and visual problems and tended not to report learning disabilities. In the subsequent assessment by the rehabilitation team some children with these problems were subsequently found to have perceptual disability.

The overall confirmed motor disability rate in this study (28/1 000) was higher than in other studies.[3,7,8] (and J Irlam — unpublished report). A reason for this may be that 'unco-ordinated' or clumsy children were included in this classification as having mild motor disability, as they have potential learning difficulties, which would require intervention. As far as the author is aware there are no population-based prevalence rates for cerebral palsy in developing countries. The prevalence rate for cerebral palsy (10/1 000) found in this study is five times higher than in the developed countries of Ireland (1.7/1 000), the USA (2/1 000), and Sweden (2.3/1 000).[9-11] The reasons for this high rate need to be investigated, although Dowding and Barry[10] suggest that socio-economic factors have an impact on the prevalence rates

of cerebral palsy, especially the diplegic and hemiplegic types. This may contribute to the high prevalence in this study. It is unlikely to be the only factor as the quality of obstetric care also plays a vital role.

The prevalence rate of 20/1 000 for confirmed hearing disability in this study is higher than the prevalence rate in Irlam's unpublished report from KwaZulu-Natal and double the rate found in Jamaica.[1] The high rate of hearing disability in this study may reflect the general difficulty in treating ear infections, especially in rural areas. The main cause of hearing disability was chronic ear infection. A few children had suffered from an ear infection for 6 - 8 years. A child with a chronic untreated ear infection may not only develop a hearing disability, but school performance may also be compromised.[12] Of the children with a confirmed hearing disability, 33% had both a hearing disability and some degree of perceptual disability. The correct management of ear infections could prevent hearing disability, which ultimately has an effect on school performance.

The overall prevalence rate of seizure disorders is 9/1 000, which includes all children who have active, non-febrile seizures. The rate in this study is slightly higher than the rate found in rural Bushbuckridge (7/1 000).[13] Of the children with seizures, 79% did not receive any medication. This rate is higher than the 57% found in Bushbuckridge. Despite improved access to health care services, there is a failure to prevent and correctly manage disabling conditions. The management of seizure disorders clearly needs to be reviewed in rural areas.

Conclusion

The overall prevalence rate for children with disabilities under 10 years in the Manguzi subdistrict is similar to rates found in other rural areas. The fact that 6% of rural children are disabled has huge implications for the delivery of health, welfare and educational services to these children where resources are limited. It is suggested that: (*i*) health, welfare and educational departments must collaborate for effective service delivery; (*ii*) disability prevention must be a high priority because the large number of children with disabilities is a great cost, both to their families and to the state — this requires a multifaceted and multidisciplinary intervention strategy with a focus on primary prevention; (*iii*) the number of rehabilitation staff allocated to rural districts should be in accordance with the prevalence rate of disability; and (*iv*) educational and welfare facilities, such as special schools, day care and training centres for disabled children, must be developed in rural areas. The present educational policy is to integrate disabled children into normal schools, i.e. the inclusion policy, but minimal resources have been allocated for this to be made practical in schools. The large number of rural children with disabilities will continue to be a burden unless service providers, working together, can develop appropriate rehabilitation programmes.

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