

Table 2. Prevalence of Blindness, Low Vision, and Monocular Visual Impairment by Age Group and Sex

Sex	Age Group (Years)	Vision Status					
		Blindness ^a		Low Vision ^b		Monocular Visual Impairment ^c	
		n (%)	95% CI	n (%)	95% CI	n (%)	95% CI
Males	5–29	5 (0.7)		14 (1.9)		22 (3.0)	
	30–49	6 (3.3)		19 (10.6)		13 (7.2)	
	50+	24 (20.7)		42 (36.2)		13 (11.2)	
	Overall	35 (3.4)	(2.5–4.6)	75 (7.2)	(5.8–8.9)	48 (4.6)	(3.5–6.1)
Females	5–29	4 (0.4)		16 (1.7)		19 (2.0)	
	30–49	25 (6.9)		35 (9.6)		29 (8.0)	
	50+	38 (24.5)		66 (42.6)		13 (8.4)	
	Overall	67 (4.6)	(3.7–5.7)	117 (8.0)	(6.7–9.6)	61 (4.2)	(3.2–5.4)
Total	5–29	9 (0.5)		30 (1.8)		41 (2.4)	
	30–49	31 (5.7)		54 (9.9)		42 (7.7)	
	50+	62 (22.9)		108 (39.9)		26 (9.6)	
	Overall	102 (4.1)	(3.4–4.8)	192 (7.7)	(6.7–8.7)	109 (4.4)	(3.6–5.3)

^aPresenting VA of less than 3/60 in the better eye.

^bPresenting VA of at least 3/60 but less than 6/18 in the better eye.

^cPresenting VA of at least 6/18 in the better eye and VA of less than 6/18 in other eye.
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in the denominator under the assumption that they had no visual impairment revealed prevalence of blindness = 3.5% (95% CI, 2.9–4.1), low vision = 6.5% (95% CI, 5.7–7.5), and monocular visual impairment = 3.7% (95% CI, 3.1–4.5). The size of change in prevalence was a 15% reduction based on prevalence in the 2,499 persons examined. Agreement of the examiners who participated in the survey against our standard (F. Ole-Sempele) ranged from 89% to 99%, and the overall kappa statistic was 0.61.

Causes of Blindness, Low Vision, and Monocular Visual Impairment

The main causes of visual impairment are summarized in Table 3. Cataract was the leading cause of blindness (41.2%), followed by trachoma (35.3%), nontrachomatous corneal opacity (18.6%), and other causes (4.9%). Low vision was caused mainly by trachoma (58.1%) and cataract (29.3%); whereas nontrachomatous corneal opacity and “other causes” accounted for 6.8% and 5.8% of low vision, respectively. Causes of monocular visual impairment were trachoma (37.6%), other causes (31.2%), cataract (22.0%), and nontrachomatous corneal opacity (8.3%). Trachoma was the leading cause of any form of visual impairment (46.8%), followed by cataract, other causes, and nontrachomatous corneal opacity at 30.3%, 12.7%, and 10.2%, respectively. Visual impairment due to cataract and trachoma increased markedly with increasing age. Other causes of visual impairment were more common in persons aged less than 30 y compared to those aged 30 y and above.

Burden Estimates of Visual Impairment

Burden estimates for all forms of visual impairment in Mankien payam are shown in Table 4. It was estimated that blindness affected 1,154 persons (lower and upper bounds = 782–1,799). Low vision affected 2,291 persons (lower and upper bounds = 1,820–2,898); whereas 1,556 persons (lower and upper bounds = 1,145–2,152) had monocular visual impairment. Therefore, up to 6,849 persons (13.7% of target

population) in Mankien payam were estimated to have some form of visual impairment.

Discussion

This population-based survey provides some of the first contemporary survey data on the prevalence of blindness in southern Sudan, and is consistent with the initial reports that blindness is a severe public health problem in Mankien payam. The study provides data for priority setting and planning for prevention of blindness activities in Mankien. The prevalence of blindness in persons aged 5 y and above was 4.1% whereas low vision prevalence was 7.7%. The prevalence was comparable between males and females. The main causes of blindness were considered to be cataract (41.2%) and trachoma (35.3%). Three fifths of low vision was caused by trachoma and a third by cataract. For planning purposes, it is estimated that up to 6,849 persons had some form of visual impairment in the study population. These data will be used for estimating intervention goals for primary eye care services, eye surgery, trachoma control, and rehabilitation of the blind.

Our study was conducted in a logistically challenging postconflict setting and has several limitations associated with the difficulty of doing field studies in this environment. Twelve villages had to be excluded from the sampling frame because they were considered insecure, and clearance to enter them was denied. Although this is a potential source of bias, we do not expect this to have affected the validity of this survey given the homogenous nature of the payam and the potential risk factors that predispose these communities to blindness. We used the random walk method to select households because it was considered the most practical given the terrain, absence of maps, and difficulty of using geographic positioning systems (GPS). The random walk method, although acceptable for other purposes, is not ideal where the outcome being assessed is one that is obvious to those involved in guiding the survey teams. Bias could have been introduced because the village guides may have been