Prevalence of diabetes mellitus as obtained by nationwide screening in urban areas of Bangladesh

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Asia, including Bangladesh, is in the grip of a diabetes epidemic and has become home to the largest diabetic population.[1] Recent evidence has confirmed that diabetes amplifies the increased risk of premature death from other noncommunicable diseases in these populations. Nonetheless, nationwide data on diabetes is still suboptimal in Bangladesh, especially for those aged 18 years and older. The Demographic and Health Survey data are for those aged 35 years and older. One study recently reported a prevalence of 9.8% among urban adults for those aged 18 years and older.[2] Most other reports for this age group are fragmented and done on a smaller scale in scattered places.

Given the backdrop, we have carried out a nationwide screening – but based in urban locations – of diabetes using random capillary blood glucose among adults aged 18 years and older. For this purpose, we have trained 64 medical officers in blood glucose screening procedures and recording of data on a prescribed form. They were selected from all the 64 district level health managers' (civil surgeons) office responsible for their respective districts. Also, 64 health education officers from 64 districts were trained for campaigning and helping the medical officers to organise screening camps. Educational materials for these pieces of training were provided by the Bureau of Health Education, a central agency of the Ministry of Health and Family Welfare dedicated to the health education and promotion of the people in Bangladesh.

We set up a total of 256 diabetes screening camps (4 x 64 districts) at the premises of medical college hospitals or district (Sadar) hospitals on World Health Day, 7 April 2016. The theme of the Day was diabetes. We distributed flyers and, using hand-microphones, announced the free measurement of capillary blood glucose from the morning hours and until noon. We targeted a total of 13,600 volunteers to participate (50 x 256 camps =12,800 plus an additional 800 participants from the Dhaka district because of its large population). Finally, 13,564 people were screened.

During the screening we collected and recorded information for each participant such as age, sex, history of blood glucose measurement and treatment of diabetes. Glucose measurements were done by laboratory technologists under the supervision of medical officers using Accuchek® glucometers and strips of single batch all over the country. Measurements were done irrespective of prandial status.

Table 1 shows a summary of the blood glucose screening in all 64 districts of Bangladesh on World Health Day, 7 May 2016. Of the 13,564 participants, 8,650 (63.8%) were men. The mean age of the participants was 41.9 years (men, 43.0 years; women, 39.7 years) with a standard deviation of 11.9 years. Only 29.3% of the participants had lifetime measurement of blood glucose, and doctors told 13.1% that they had had diabetes. Antidiabetes medication had been used by 11.6%.

Based on the capillary casual blood glucose cut-off point of 11.1 mmol/L,[3] the age-standardised (to the latest census population of Bangladesh of 2011) prevalence of diabetes was 7.5%. However, considering either high blood glucose or medication history, the prevalence was 14.2%. An impressive proportion (89.0%) of known persons with diabetes was receiving medication. However, the control was not that tight. Only 61.7% had a glucose level <11.1 mmol/L. Additionally, some of them might have been in fasting status and, for these, the cut-off point for diabetes control is much lower. Gener-

Table 1 Prevalence* of diabetes among voluntary participants of blood glucose screening in all 64 districts of Bangladesh, World Health Day, 7 May 2016

Age groups, years	No (%) of subjects	Lifetime measurement of blood glucose	Known person with diabetes (as told by doctor)	On medication for diabetes control	Mean (SD) capillary blood glucose, mmol/L	Capillary blood glucose ≥11.1 mmol/L	Blood glucose ≥11.1 mmol/L or medication	Newly detected diabetes	Control status of those on medication (blood glucose <11.1 mmol/L)‡
Men									
18–24	363 (48.2)	38 (10.5)	6 (1.7)	4 (1.1)	5.2 (1.5)	2 (0.6)	4 (1.1)	0	2 (50.0)
25-34	1641 (59.3)	389 (23.7)	81 (4.9)	71 (4.3)	5.9 (2.4)	54 (3.3)	101 (6.1)	30 (1.8)	47 (66.2)
35–44	2237 (59.9)	839 (37.5)	360 (16.1)	311 (13.9)	6.8 (3.2)	218 (9.7)	383 (17.1)	72 (3.2)	165 (53.1)
45–54	2635 (67.1)	1294 (49.1)	705 (26.8)	627 (23.8)	7.6 (3.9)	382 (14.5)	724 (27.5)	97 (3.7)	342 (54.5)
55–64	1365 (75.6)	718 (52.6)	433 (31.7)	393 (28.8)	8.1 (4.2)	249 (18.2)	465 (34.1)	72 (5.2)	216 (55.0)
65+	409 (71.2)	181 (44.2)	133 (32.6)	117 (28.6)	7.6 (3.8)	65 (13.8)	132 (32.3)	15 (3.7)	67 (57.3)
All (crude)	8650 (63.8)	3459 (40.0)	1718 (19.9)	1523 (17.6)	7.1 (3.6)	970 (11.2)	1809 (20.9)	286 (3.3)	839 (55.1)
All (adjusted†)		**28.9**	**12.4**	**10.8**		**6.8**	**13.0**	**2.1**	**56.3**
Women									
18–24	389 (51.7)	37 (9.5)	9 (2.3)	9 (2.3)	5.1 (1.6)	6 (1.5)	13 (3.3)	4 (1.0)	7 (77.8)
25–34	1126 (40.7)	322 (28.6)	100 (8.9)	86 (7.6)	5.8 (2.3)	50 (4.4)	109 (9.7)	23 (2.0)	59 (68.6)
35–44	1500 (40.1)	533 (35.5)	246 (16.4)	220 (14.7)	6.9 (3.5)	158 (10.8)	270 (18.0)	50 (3.3)	112 (50.9)
45–54	1294 (32.9)	569 (44.0)	336 (26.0)	314 (24.3)	7.5 (4.0)	198 (15.3)	368 (28.4)	54 (4.2)	170 (54.1)
55–64	440 (24.4)	193 (43.9)	120 (27.2)	103 (23.4)	7.8 (4.4)	65 (14.3)	124 (28.2)	21 (4.8)	59 (57.3)
65+	165 (28.7)	61 (37.0)	33 (20.0)	30 (18.2)	7.4 (4)	24 (14.5)	41 (24.8)	11 (6.7)	17 (56.7)
All (crude)	4914 (36.2)	1715 (34.9)	844 (17.2)	762 (15.5)	6.8 (3.5)	501 (10.2)	925 (18.8)	163 (3.3)	424 (55.6)
All (adjusted†)		**29.0**	**13.4**	**12.0**		**8.0**	**14.9**	**2.9**	**63.7**
Both sexes									
18–24	752 (5.5)	75 (10.0)	15 (2.0)	13 (1.7)	5.1 (1.6)	8 (1.1)	17 (2.3)	4 (0.5)	9 (69.2)
25–34	2767 (20.4)	711 (25.7)	181 (6.5)	157 (5.5)	5.8 (2.3)	104 (3.8)	210 (7.6)	53 (1.9)	106 (67.5)
35–44	3737 (27.5)	1372 (36.7)	606 (16.2)	531 (14.2)	6.8 (3.3)	376 (10.1)	653 (17.5)	122 (3.3)	277 (52.2)
45–54	3929 (29.0)	1863 (47.4)	1041 (26.5)	941 (23.9)	7.6 (4.0)	580 (14.7)	1092 (27.8)	151 (3.8)	512 (54.4)
55–64	1805 (13.3)	911 (50.5)	553 (30.6)	496 (27.5)	8.0 (4.3)	314 (17.4)	589 (32.6)	93 (5.1)	275 (55.4)
65+	574 (4.2)	242 (42.2)	166 (28.9)	147 (25.6)	7.6 (3.9)	89 (15.5)	173 (30.1)	26 (4.5)	84 (57.1)
All (crude)	13564 (100.0)	5174 (38.1)	2562 (18.9)	2285 (16.8)	6.9 (3.5)	1471 (10.8)	2734 (20.2)	449 (3.3)	1263 (55.3)
All (adjusted†)		**29.3**	**13.1**	**11.6**		**7.5**	**14.2**	**2.5**	**61.7**

*Results are number (%) unless indicated otherwise; SD indicates standard deviation.
†Adjusted for Bangladesh national population of Census 2011.
‡This is likely be an overestimation because some might be in fasting status.

ally, awareness and control of diabetes is poor in Bangladeshi adults, perhaps due to low education and low economic status.[4]

These blood glucose testing camps in all major urban areas of Bangladesh could bring an additional 2.5% of people (from the base of 13,564 participants) whose diabetes status was unknown. This percentage appears to be small, but can be considered promising compared with a somewhat similar screening campaign in Saudi Arabia that identified 1.8% of newly diagnosed cases of diabetes.[5]

There is hardly any national level screening for diabetes in Bangladesh with which to compare our data, but our age-standardised prevalence of 14.2% was on the higher side compared with the reported prevalence in the urban population of 9.8% for the same age group.[2] Our screening was done only in urban areas and in tertiary level hospital premises, where some of the participants might have come to the hospital for diagnostic services. Therefore, our results may not represent the general population, and the population resides in rural areas. We used a casual blood glucose level of ≥11.1 mmol/L, in the absence of classic symptoms, for labelling diabetes in this study.[3] However, some participants, as mentioned earlier, might have been in fasting status, which may have compensated this issue. Moreover, more people with diabetes might have volunteered for blood glucose testing compared with their healthy counterparts leading to a higher prevalence of diabetes. Organising screening camps in public places other than hospital premises could potentially minimise these limitations and make estimates more representative.

Key messages

- Nationwide diabetes screening performed on a health day observance was practicable
- It estimated the comparable prevalence(s) of diabetes
- This approach might be useful and used as an example, especially for low resource settings

Conflict of interest None declared. The authors alone are responsible for the views expressed in this article, which do not necessarily represent the views, decisions or policies of the institutions with which they are affiliated.

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