



# Reports of wheezing and of diagnosed asthma are associated with impaired social functioning: Secondary analysis of the cross-sectional World Health Survey data<sup>☆</sup>

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## ABSTRACT

**Objective:** We sought to investigate whether there are associations between asthma and social functioning in adults from Western and non-Western countries.

**Methods:** We analyzed data on individuals (94% aged 20+, 52% female) from 50 countries participating in the cross-sectional World Health Survey. We used information on self-reports of wheezing and an asthma diagnosis. Social functioning was defined by reports of severe or extreme difficulties related to personal relationships or participation in the community. Logistic regression was used to estimate adjusted odds ratios (ORs) and 95% confidence intervals (CIs).

**Results:** Wheezing was associated with impaired social functioning both in the overall sample (OR = 2.40, 95%CI = 2.09–2.75) and in Africa, South America and Asia (ORs  $\geq$  2.47), but not in Europe (aOR = 1.26, 95%CI = 0.90–1.77). Analyses with self-reports of diagnosed asthma yielded similar, albeit weaker, associations (e.g. OR for the overall sample = 1.63, 95%CI = 1.38–1.92). We also combined asthma and wheezing into a single variable (reference group: no asthma diagnosis/no wheezing). We observed that in particular reports of wheezing were associated with impaired social functioning regardless of whether a concomitant asthma diagnosis was reported (OR = 2.19, 95%CI = 1.81–2.64) or not (OR = 2.50, 95%CI = 2.09–2.99).

**Conclusion:** Self-reports of wheezing and of diagnosed asthma are associated with impaired social functioning among adults in Africa, South America and Asia, but less so in Europe. These relationships are mainly driven by the experience of respiratory symptoms (i.e. wheezing). Our findings may partly be explained by regional variations in asthma control. Further research should elucidate the determinants and mechanisms of asthma-related impaired social functioning.

## 1. Introduction

It has been estimated that there are 315 million adults with asthma worldwide and almost 623 million with asthma-related symptoms [1]. Asthma may exert detrimental effects on numerous domains of life, one of which is social functioning [2–4], as reflected by, for instance, restricted or lack of participation in social activities [5] and poor quality of social relationships [4]. Research in this area remains sparse however and has to our knowledge only been carried out in pediatric or adolescent study populations [2–5]. There is thus a need to examine

whether the possible adverse social implications of asthma also hold true among adults. The perceived and actual social environment of adults and their repertoire of coping strategies will differ from those of children and adolescents, and may thereby affect the link between asthma and impaired social functioning.

Also of concern is that most of this literature emanates from Western populations (e.g. North American and Europe). It remains unclear whether western findings generalize to other regions and countries. Significantly, in countries with limited access to health care or sub-optimal health system responsiveness, asthma symptoms may go

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**Table 1**  
Characteristics of the study population (WHO World Health Survey, 2002/2003).

	Overall sample		Undiagnosed & asymptomatic		Diagnosed & asymptomatic		Diagnosed & symptomatic		Undiagnosed & symptomatic	
	%	n	%	n	%	n	%	n	%	n
Age (yrs)										
15–19	6.0	12,525	6.3	11,495	4.8	225	3.0	175	3.7	382
20–29	25.3	57,564	26.3	52,591	21.6	1067	14.9	892	17.4	1922
30–39	21.1	57,067	21.6	51,977	19.7	988	14.8	1062	17.7	2131
40–49	17.9	42,995	18.0	38,562	17.0	785	16.1	951	17.0	2004
50–59	13.1	28,277	12.6	24,732	13.2	558	17.8	844	18.2	1658
60–69	9.3	20,262	8.6	17,146	13.2	489	18.6	856	14.1	1486
70 +	7.3	17,096	6.6	14,132	10.4	443	14.8	796	11.9	1436
Female	52.4	130,487	52.3	116,359	54.5	2717	55.4	3292	51.6	6154
Marital status										
Married	63.5	144,668	63.5	130,184	60.3	2613	62.9	3408	64.7	6840
Never married	20.7	45,623	21.4	41,259	20.1	884	13.5	787	13.9	1602
Cohabiting	3.7	11,935	3.6	10,778	6.1	295	4.6	218	4.3	456
Separated/divorced/ widowed	12.1	32,744	11.4	28,331	13.6	759	19.0	1160	17.2	2119
Education										
No school	23.1	51,315	22.4	44,188	22.9	974	31.7	1668	28.1	3467
Less than primary	10.8	28,584	10.4	24,978	11.6	633	14.0	880	13.1	1547
Primary completed	18.4	46,958	18.4	41,928	19.1	950	18.4	1145	19.3	2276
Secondary completed	20.3	57,607	21.0	53,279	16.1	939	13.3	890	15.8	1942
Greater than secondary	27.4	50,579	27.8	46,247	30.3	1052	22.6	994	23.7	1778
Currently employed	57.0	124,649	58.1	114,173	50.9	2243	44.0	2437	50.2	5200
Currently smoking	28.5	55,957	27.5	49,617	29.7	1075	32.7	1423	39.4	3700
Poor mental health <sup>a</sup>	14.0	29,526	12.1	24,283	18.6	705	30.6	1425	30.5	2962
Obesity <sup>b</sup>	11.5	22,044	11.1	19,228	12.8	630	14.0	707	15.8	1325
Impaired social functioning <sup>c</sup>	6.7	10,763	5.7	8621	8.0	270	14.7	595	15.2	1192

<sup>a</sup> Poor mental health was considered positive, if severe or extreme difficulties were reported related to depressive symptoms or anxiety throughout the last 30 days.

<sup>b</sup> Obesity was defined by a body mass index  $\geq 30$  kg/m<sup>2</sup> as derived from self-reported height and weight.

<sup>c</sup> Impaired social functioning was considered positive, if severe or extreme difficulties were reported related to personal relationships, participation in the community or conflicts and tensions with others throughout the last 30 days.

untreated or undertreated for relatively longer periods of time thereby exerting an even greater impact on patients' social life. Assuming that the likelihood of receiving rapid and effective treatment is lower in non-Western regions [6], stronger links between asthma and impaired social functioning may be expected.

In light of the above-mentioned considerations, we sought to expand research on asthma and social functioning from Western samples to populations in non-Western countries and to specifically study adults.

## 2. Methods

### 2.1. Study population

The current analyses drew on data from a subset of 50 countries that participated in the cross-sectional World Health Survey (WHS). Briefly, the WHS was carried out in 2002/2003 in 70 countries across five continents (i.e. Europe, Australia, South America, Asia and Africa) [7–9]. In the majority of countries (i.e., 64/70), nationally representative samples of men and women were drawn based on multi-stage cluster sampling procedures [10]. The sampling process was stratified by gender, age and residential area (rural/urban). In most countries, enumeration areas and households were used as additional stratification units. According to the World Health Organization, the interview section addressing health was developed with careful consideration of the International Classification of Functioning, Disability and Health (ICF) [10]. The items that capture functioning (denoted as “health state descriptions”) were derived from prior qualitative and psychometric cross-cultural research, including cognitive interviewing and other procedures to maximize the validity of cross-cultural assessments [10]. The interviews were carried out in face-to-face contact by trained staff. Good response rates were achieved, varying from 63% (Israel) to 99% (The Philippines). The study was approved by ethics

committees at each WHS site and informed consent was obtained from all study participants [11].

### 2.2. Wheezing and asthma

Wheezing - a cardinal symptom of asthma - was considered present if an affirmative answer was provided to the following question: “During the last 12 months, have you experienced any of the following? Attacks of wheezing or whistling breathing [...]” (yes – no – don't know). Individuals responding “don't know” were excluded from the analysis. A second asthma indicator was based on the following questionnaire item: “Have you ever been diagnosed with asthma (an allergic respiratory disease)?” Response categories were “yes”, “no”, and “don't know”. Again, individuals specifying, “don't know” were excluded.

### 2.3. Social functioning

Social functioning, which relates to the ICF domains “participation” and “activities”, was measured by two items. These items were included in a module that assessed limitations in eight different life domains (i.e., mobility, self-care, pain/discomfort, subjective cognitive deficits, interpersonal activities [denoted as social functioning in the present paper], vision, sleep/energy, and affect). The respective items were: “Overall in the last 30 days, how much difficulty did you have with personal relationship or participation in the community?” and “In the last 30 days, how much difficulty did you have in dealing with conflicts and tensions with others?”. Responses to each item were to be specified on a 5-point Likert scale (“no difficulty”, “mild”, “moderate”, “severe”, and “extreme/cannot do”). In accordance with earlier research [12], we categorized participants as experiencing social impairment when they reported severe or extreme difficulties on either item.

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