

---

# US prevalence of hyperhidrosis and impact on individuals with axillary hyperhidrosis: Results from a national survey

David R. Strutton, PhD, MPH,<sup>a</sup> Jonathan W. Kowalski, PharmD, MS,<sup>b</sup> Dee Anna Glaser, MD,<sup>c</sup> and Paul E. Stang, PhD<sup>a</sup>  
*Sterling, Virginia; Irvine, California; and St Louis, Missouri*

**Background:** The current epidemiologic data on hyperhidrosis are scarce and insufficient to provide precise prevalence or impact estimates.

**Objective:** We sought to estimate the prevalence of hyperhidrosis in the US population and assess the impact of sweating on those affected by axillary hyperhidrosis.

**Methods:** A nationally representative sample of 150,000 households was screened by mailed survey for hyperhidrosis and projected to the US population based on US census data. Ascertainment of hyperhidrosis was based on a question that asked whether participants experienced excessive or abnormal/unusual sweating.

**Results:** The prevalence of hyperhidrosis in the survey sample was 2.9% (6800 individuals). The projected prevalence of hyperhidrosis in the United States is 2.8% (7.8 million individuals), and 50.8% of this population (4.0 million individuals) reported that they have axillary hyperhidrosis (1.4% of the US population). Only 38% had discussed their sweating with a health care professional. Approximately one third of individuals with axillary hyperhidrosis (0.5% of the US population or 1.3 million individuals) reported that their sweating is barely tolerable and frequently interferes, or is intolerable and always interferes, with daily activities.

**Conclusion:** Hyperhidrosis affects a much larger proportion of the US population than previously reported. More than half of these individuals have axillary hyperhidrosis, in which sweating can result in occupational, emotional, psychological, social, and physical impairment. (*J Am Acad Dermatol* 2004; 51:241-8.)

**H**yperhidrosis is defined as excessive sweating beyond what would be expected for the local environment and is physiologically required by the body.<sup>1,2</sup> Primary hyperhidrosis (excessive sweating without an alternative origin) is

localized, characteristically symmetric, and can affect the axillae, palms of hands, soles of feet, face, and other areas.<sup>2,3</sup> Primary hyperhidrosis is suggested to result from overactivity of the sympathetic nervous system. Secondary hyperhidrosis can be focal or generalized<sup>3,4</sup> and result from any number of conditions including febrile illness, endocrine and metabolic conditions, neurologic disorders, cardiovascular disorders, respiratory disorders, cerebrovascular disorders, medication use, substance abuse, spinal cord injuries, diabetes, menopause, neoplastic disease, and infection.<sup>2,5-9</sup> Excess sweating can be compounded by anxiety and stress, and can range from moderate moisture to severe dripping,<sup>10</sup> which can in return exacerbate the associated anxiety and stress.

Symptoms of hyperhidrosis can manifest differently for the various areas affected such as soiled or damaged clothing, paperwork, and shoes, and obvious sweat marks on clothing or unappealing cold wet handshakes. More importantly, excess

---

From Galt Associates Inc, Sterling, Virginia<sup>a</sup>; Allergan Inc, Irvine, California<sup>b</sup>; and Saint Louis University School of Medicine.<sup>c</sup>

Supported by Allergan Inc.

Disclosures: Drs Strutton, Stang, and Glaser are consultants to Allergan Inc. Dr Glaser owns stock in Allergan Inc. Dr Kowalski is employed by and owns stock in Allergan Inc.

Presented at the American Academy of Dermatology 2003 Annual Meeting and in part at the Canadian Dermatology Association 2003 Annual Meeting.

Accepted for publication December 2, 2003.

Reprint requests: Jonathan W. Kowalski, PharmD, MS, Allergan Inc, 2525 Dupont Dr, Irvine, CA 92623-9534. E-mail: [Kowalski\\_Jonathan@Allergan.com](mailto:Kowalski_Jonathan@Allergan.com).

0190-9622/\$30.00

© 2004 by the American Academy of Dermatology, Inc.

doi:10.1016/j.jaad.2003.12.040

sweating of the armpits, hands, feet, or face can result in substantial impairment for the patient, including limitations in work, social interaction, physical activities, and leisure, as well as emotional and psychological distress.<sup>1-3,10-18</sup> The negative effect of primary hyperhidrosis on health-related quality of life has been reported by validated questionnaires to be similar or greater than that reported for other dermatologic (eg, psoriasis) and nondermatologic chronic diseases.<sup>14-18</sup>

Diagnosis and treatment of hyperhidrosis may be aided by clinical tests including Minor's iodine-starch test and gravimetric quantification of sweat production.<sup>5,19,20</sup> Gravimetric quantification of sweat production is not routinely used in clinical practice, but is typically used as an efficacy measure in clinical research. In addition, patient reports of the effect of hyperhidrosis on daily activity or other aspects of health-related quality of life provide valuable information regarding disease severity and therapeutic management.<sup>15</sup>

Therapeutic options for hyperhidrosis vary by focal location and range from topical therapy to surgery. Nonsurgical treatments include topical aluminum chloride hexahydrate, oral anticholinergics, tap water iontophoresis with or without anticholinergics, and intradermal injection of botulinum toxin.<sup>1,2,10-12,20</sup> Surgical techniques for treatment of hyperhidrosis include endoscopic transthoracic sympathectomy,<sup>11</sup> excision of axillary sweat glands, and axillary liposuction.<sup>1,2,10,21</sup>

The current epidemiologic data on the prevalence of hyperhidrosis are scarce and insufficient to provide precise estimates in the general population. The most common estimate cited in the literature is based on a single publication referencing an unpublished pilot study of a young Israeli population that reported an incidence of 0.6% to 1% of hyperhidrosis of all severities and locations.<sup>4</sup> As this publication does not offer the methods used to ascertain or calculate this estimate, it is unclear if this represents a true incidence or prevalence estimate of disease. The limitations of this study are well recognized,<sup>2,3,5,10,22,23</sup> however, the study is cited frequently without mention of these limitations. Thus, given the paucity of reliable epidemiologic information in the current medical literature, the purpose of this research was to estimate the prevalence of hyperhidrosis in the US population and to assess the impact of sweating on those affected by axillary hyperhidrosis.

## METHODS

Using a consumer omnibus survey, 150,000 US households were screened with a series of questions to define the US hyperhidrosis population. The

number of households surveyed was calculated based on an estimated incidence of 0.6% to 1%<sup>4</sup> of the US population older than 12 years with hyperhidrosis (we assumed this to be a prevalence figure for the purposes of the sample size estimate). The sample source was NFO WorldGroup's consumer panel, which consists of a nationally representative sample of US households. Because the sampling frame was the household, with one reporter per household (usually the female head of the household), information on sex and ages of all members of the household was collected so that results could be extrapolated to the general US population.

National projections were developed using iterative proportional fitting, which is a common margin weighting methodology.<sup>24,25</sup> This technique uses an iterative process, where for each weighting variable the marginal totals are weighted back to US census quotas. Once the iterative process has a properly weighted sample, the final weight for each individual is further adjusted by a projection factor, which is simply the size of the population divided by the sample. The weighting variables used include geographic division, market size, head of household age, income, and household size.

The survey panel members were recruited through a variety of sources, including direct mail and referral. Those interested in participating in the panel completed a recruitment survey, which provided demographic information on members. Mean panelist tenure was a little more than 4 years and respondents were not compensated for their participation.

## Survey description

The questions administered in this survey were designed to identify those with hyperhidrosis in the target population, regardless of whether they had been given a diagnosis by a physician, and to define the prevalence, demographics, disease characteristics, and impact of hyperhidrosis in the sample population. The ascertainment of hyperhidrosis was based on a question that asked whether the participant had excessive or abnormal/unusual sweating. Information on current age, sex, age of onset, focal location of sweating, and if they had discussed sweating with a health care professional was also determined. In particular, axillary hyperhidrosis was defined as excessive sweating of the underarms. The severity and impact of hyperhidrosis was assessed using the Hyperhidrosis Disease Severity Scale (HDSS) and items from the Hyperhidrosis Impact Questionnaire, which is a validated and reliable instrument that has been used in other studies of hyperhidrosis and its impact.<sup>17,26</sup>

**Table I.** Prevalence and demographics of hyperhidrosis

	No. of individuals (SE)	US prevalence rate (%)	Mean age (y) (SE)	Mean onset age (y) (SE)	No. of individuals who discussed sweating with health care professional (SE)	Proportion (%) who discussed sweating with health care professional
All	7,772,850 (95,961)	2.8	39.8 (0.2)	25.2 (0.2)	2,956,100 (14,228)	38.0
Male	3,897,530 (70,061)	2.9	38.5 (0.3)	21.6 (0.3)	1,115,004 (29,729)	28.6
Female	3,862,328 (66,525)	2.8	41.2 (0.3)	28.6 (0.3)	1,836,386 (28,069)	47.5
Age group (y)						
0-5	111,211 (13,611)	0.5				
6-11	166,810 (15,027)	0.7				
12-17	381,160 (21,866)	1.6				
18-24	749,518 (35,368)	2.8				
25-34	1,669,324 (49,557)	4.5				
35-44	1,683,280 (45,617)	3.8				
45-54	1,607,872 (39,347)	4.3				
55-64	821,532 (25,906)	3.5				
65+	567,036 (21,754)	1.7				

The HDSS was used to determine the severity of sweating experienced by the respondents. A 4-point, single-item question, the HDSS asks patients to indicate which of the following best describes the impact of sweating on their daily activities: (1) never noticeable, never interferes; (2) tolerable, sometime interferes; (3) barely tolerable, frequently interferes; or (4) intolerable and always interferes. In addition, impairment and burden of disease was assessed based on items from the Hyperhidrosis Impact Questionnaire,<sup>26</sup> which examined the ways sweating affected components of the individuals' daily life, and how their sweating affected them emotionally and limited them in various activities.

## RESULTS

Among the 150,000 households sampled, 69% responded to the survey and 64% completed the necessary components for the prevalence estimate. There did not appear to be substantive response bias as the demographics of the respondents were very similar to the total panel sampled and there was little difference between responders and nonresponders. Any variation in demographics between these groups was adjusted for in the weighting process, so that the final weighted sample of data was representative of the total panel sampled and the US population.

The prevalence of hyperhidrosis in the survey sample was 2.9%. After the results of this survey were extrapolated to the US population, the data indicate that approximately 7.8 million individuals in the United States (or 2.8% of the population) have hyperhidrosis (Table I) based on the criteria above. The reported rate of hyperhidrosis was similar in

male and female responders, affecting 2.9% and 2.8%, respectively. The average age of individuals with hyperhidrosis was 40 years and the average reported age of onset was 25 years. The prevalence rates were significantly higher among individuals in the prime working-age population than any other age group with a peak prevalence among those 25 to 64 years old (3.5%-4.5%) and lowest among those younger than 12 years (prevalence rates 0.5%-0.7%). Of individuals with hyperhidrosis, 38% reported having had discussed sweating with a health care professional. However, this rate was substantially higher for female than male responders (47.5% vs 28.6%, respectively).

Our study showed that axillary hyperhidrosis, or excessive sweating of the underarms, affects 50.8% of individuals with hyperhidrosis, or about 1.4% of the US population (4 million individuals) (Table II). The average age of individuals with axillary hyperhidrosis was 37 years and the average reported age of onset was 22 years. In contrast to the overall findings for hyperhidrosis, the prevalence of axillary hyperhidrosis slightly favored male versus female responders (1.6% and 1.3%, respectively). Similar to hyperhidrosis in general, the prevalence rates were highest among those aged 18 to 54 years (1.8%-2.6%), whereas the lowest prevalence rates were among those younger than 12 years (0.1%-0.3%). As before, approximately one third of individuals with axillary hyperhidrosis reported having had discussed sweating with a health care professional, with female responders more likely to do so than male responders (39.3% vs 26.9%, respectively). Among this group with axillary hyperhidrosis, 18.7% reported that this was the only area affected by hyperhidrosis. The average age of these individuals

**Table II.** Prevalence and demographics of axillary hyperhidrosis

	No. of individuals (SE)	US prevalence rate (%)	Mean age (y) (SE)	Mean onset age (y) (SE)	No. of individuals who discussed sweating with health care professional (SE)	Proportion (%) who discussed sweating with health care professional
All	3,951,243 (70,472)	1.4	37.0 (0.3)	21.9 (0.2)	1,284,943 (30,789)	32.5
Male	2,155,738 (52,828)	1.6	37.2 (0.3)	20.3 (0.3)	580,337 (24,352)	26.9
Female	1,790,539 (46,978)	1.3	36.9 (0.4)	23.8 (0.4)	702,999 (25,433)	39.3
Age group (y)						
0-5	15,042 (5028)	0.1				
6-11	76,800 (10,190)	0.3				
12-17	277,851 (18,697)	1.2				
18-24	530,036 (29,743)	2.0				
25-34	982,409 (38,049)	2.6				
35-44	874,995 (33,053)	2.0				
45-54	672,483 (25,602)	1.8				
55-64	307,164 (15,896)	1.3				
65+	203,182 (12,961)	0.6				

was 30 years and the average reported age of onset was 19 years.

### Impairment and burden of disease for individuals with axillary hyperhidrosis

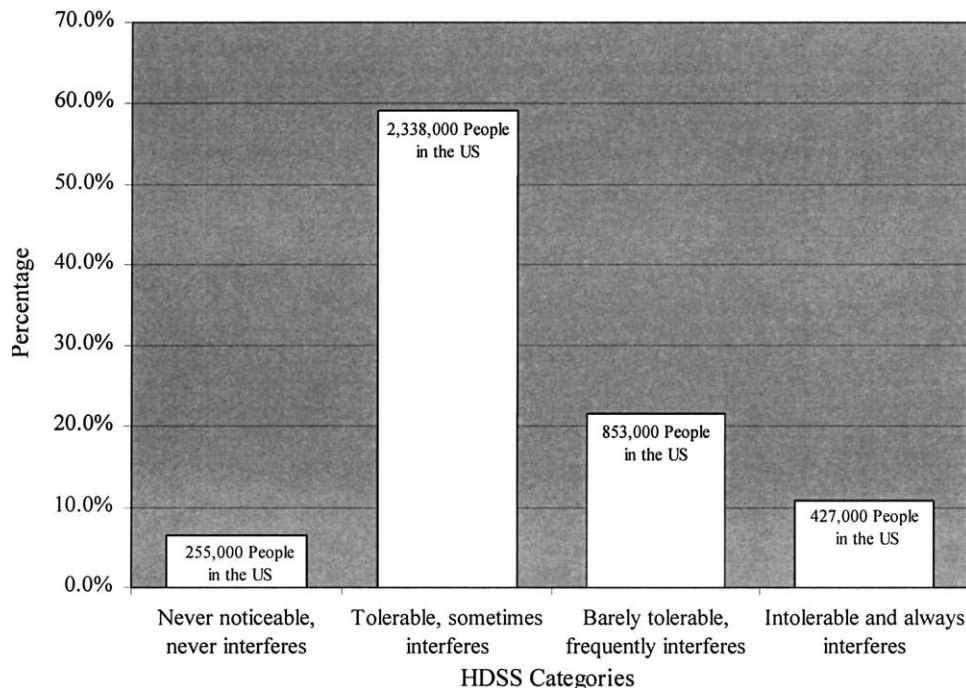
The results from the HDSS indicate that for 10.8% of the 4 million individuals with axillary hyperhidrosis, sweating was intolerable and always interfered with their daily activities (Fig 1). For another 21.6%, hyperhidrosis was reported to be barely tolerable and frequently interfering, whereas for the remaining 65.6%, the impact of sweating on their daily activities was never noticeable and never interfered, or was tolerable and only sometimes interfered with their daily activities. These results indicate that for 32.4% of those with axillary hyperhidrosis (0.5% of the US population or 1.3 million individuals), sweating is barely tolerable and frequently interferes or is intolerable and always interferes with daily activities. In addition, 91.6% reported that the disease interferes to some degree with daily activities.

The results indicate that sweating limits individuals with axillary hyperhidrosis in each of the activities studied (Table III) and the degree of the impact increased with greater HDSS score. Among the 1.3 million individuals with axillary hyperhidrosis and severe impact (an HDSS score of 3 or 4: sweating is barely tolerable and frequently interferes or is intolerable and always interferes with daily activities), 33.6% indicated that they are moderately to extremely limited by their sweating at work. Respondents from the same group also reported being moderately to extremely limited by their sweating while meeting people (46.7%), at family

occasions or with friends (35.1%), and in romantic or intimate situations (46.0%). Overall and across many levels of severity of axillary hyperhidrosis, excessive sweating appears to result in occupational, emotional, psychological, social, and physical impairment (Table III).

Table IV presents an analysis of individuals, overall and by HDSS score, who indicated they are moderately or significantly emotionally affected by their sweating. Approximately 34% of all individuals with axillary hyperhidrosis reported that they were moderately or significantly emotionally affected because of their sweating versus 64.6% of those who experience the most impairment by HDSS score. In addition, 20.1% of individuals with axillary hyperhidrosis reported feeling depressed versus 35.7% of those with axillary hyperhidrosis who were at the severe end of the HDSS spectrum (Table V).

The results of this survey detail additional components of daily life affected by sweating for individuals with axillary hyperhidrosis and, in each component, the prevalence of the impairment was higher among those with a higher HDSS score (Table V). Of individuals with axillary hyperhidrosis, 13.4% reported that they decreased the amount of time spent working, 26.0% reported that they changed the types of leisure activities pursued, 20.0% reported that they decreased the amount of time spent pursuing leisure activities, and 38.0% reported that they become frustrated with daily activities. In addition, for those individuals with axillary hyperhidrosis who are the most impaired according to their HDSS score (a score of 3 or 4), the proportion of patients affected in various components of daily life was about 50% greater and much more dramatic.



**Fig 1.** Impact of sweating on daily activities of individuals with axillary hyperhidrosis. *HDSS*, Hyperhidrosis Disease Severity Scale.

**Table III.** Proportion of individuals with axillary hyperhidrosis who report limitations\* in various activities as a result of sweating

	At work (%)	In public places (%)	First time meeting people (%)	Family occasions/with friends (%)	Shaking hands (%)	Developing personal relationships (%)	Romantic/intimate situations (%)	In sports (%)
Overall								
Any limitation	37.9	51.3	51.5	39.3	36.1	41.1	49.8	44.0
Moderately to extremely limited	16.5	23.3	26.8	17.5	18.1	20.6	27.6	26.7
HDSS score of 3 or 4 <sup>†</sup>								
Any limitation	57.0	74.2	70.2	62.0	51.4	58.5	64.5	60.8
Moderately to extremely limited	33.6	45.8	46.7	35.1	31.0	37.0	46.0	45.9
HDSS score of 1 or 2 <sup>‡</sup>								
Any limitation	29.0	40.0	42.3	28.1	28.5	32.4	42.6	35.8
Moderately to extremely limited	8.2	12.0	16.9	8.7	11.6	12.4	18.4	17.2

*HDSS*, Hyperhidrosis Disease Severity Scale.

\*Based on the following question from the Hyperhidrosis Impact Questionnaire: "Overall, how limited are they by their sweating in each of the following?" Response options: not limited, somewhat limited, moderately limited, quite a bit limited, or extremely limited.

<sup>†</sup>Sweating is barely tolerable, frequently interferes or intolerable and always interferes with daily activities.

<sup>‡</sup>Sweating is tolerable, sometimes interferes or never noticeable/never interferes with daily activities.

## DISCUSSION

This analysis provides original information on hyperhidrosis and is the first large representative survey of the prevalence and impact of this disease. The epidemiologic data on hyperhidrosis available before this analysis were insufficient to provide precise prevalence estimates or an understanding of the impact of this illness in the general population.

The data provided by this survey fill an important gap in the information available for this disease and are a necessary first step in developing a better understanding of the burden of this disease in the United States. Fig 2 provides an overview of the survey process and results.

The results of this study indicate that hyperhidrosis affects a larger group of individuals in the United

**Table IV.** Proportion of individuals with axillary hyperhidrosis who indicated they are emotionally affected by sweating

	Not affected (%)	To a small extent affected (%)	Moderately affected (%)	Significantly affected (%)
Overall	26.0	37.7	24.8	9.1
HDSS score of 3 or 4*	10.6	24.8	40.7	24.0
HDSS score of 1 or 2†	34.6	45.6	17.9	1.9

HDSS, Hyperhidrosis Disease Severity Scale.

\*Sweating is barely tolerable, frequently interferes or intolerable and always interferes with daily activities.

†Sweating is tolerable, sometimes interferes or never noticeable/never interferes with daily activities.

**Table V.** Proportion of individuals with axillary hyperhidrosis who report that sweating affects various components of daily life

	Overall (%)	HDSS score of 3 or 4* (%)	HDSS score of 1 or 2† (%)
Change the types of leisure activities pursued	26.0	41.6	18.5
Decrease amount of time spent working	13.4	21.9	9.3
Miss outings/events with friends or family	11.8	21.9	6.7
Decrease amount of time spent pursuing leisure activities	20.0	34.6	12.9
Feel unhappy	33.5	54.8	23.0
Feel depressed	20.1	35.7	12.4
Feel less confident than would like	54.6	69.8	47.6
Require help (eg, from family and friends) to perform tasks that would otherwise do on own	9.3	17.8	5.0
Become frustrated with some daily activities	38.0	58.2	27.8
Purchase additional items or accessories to help complete routine daily activities	22.7	31.4	18.1

HDSS, Hyperhidrosis Disease Severity Scale.

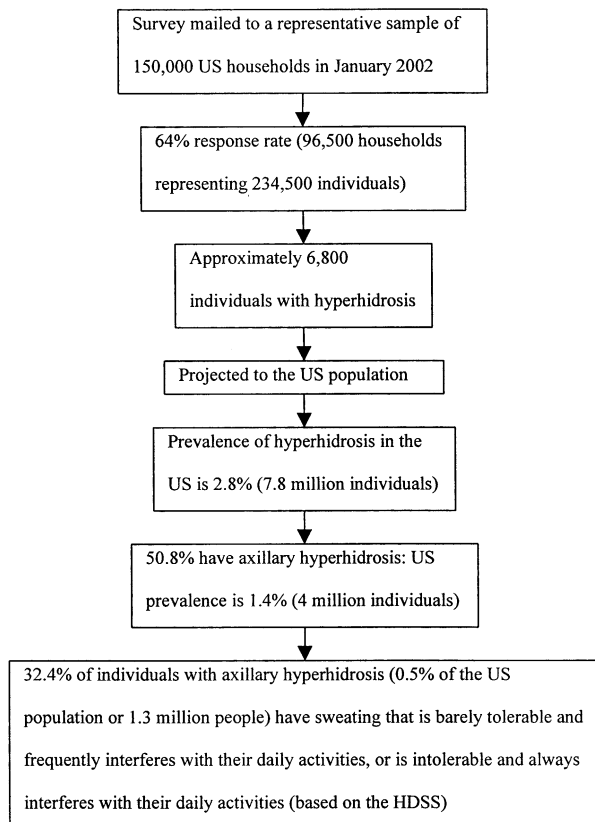
\*Sweating is barely tolerable, frequently interferes or intolerable and always interferes with daily activities.

†Sweating is tolerable, sometimes interferes or never noticeable/never interferes with daily activities.

States than previously recognized and approximately half of these individuals have axillary hyperhidrosis. This survey found that hyperhidrosis frequently causes discomfort and interference with daily activities and, although a range of treatment options is available, hyperhidrosis is still widely undiagnosed and untreated. This survey was designed to identify those with hyperhidrosis and provide an estimate of the prevalence of hyperhidrosis in the general US population (including diagnosed and undiagnosed cases). The nature of survey research makes the results intrinsically subject to the possibility of selection bias, as the respondents may not be representative of the target population. In this study, concern of selection bias causing overestimation or underestimation of the estimates is reduced by the high response rate, the comparability of responder and nonresponder demographics, and the weighting of this dataset to be representative of the general US population. The high response rate resulted from administration within an omnibus survey and to a population consisting of households that had previously agreed to participate on the panel. The

omnibus panel format not only increased the response rate, but also directly decreased the possibility of selection bias because response was more likely caused by panelists' participation in the omnibus survey than to their particular interest in responding to a questionnaire about hyperhidrosis. However, general selection bias could be operating in the original screening process for households to enter the panel although it is unlikely that this would have unduly affected the estimates that we obtained.

Although the prevalence estimates provided here are greatly strengthened by the results from the HDSS, it is important to note that no clinical tests were used to aid confirmation of hyperhidrosis. The prevalence estimates reported include a range of severity of hyperhidrosis cases and it is plausible that the use of clinical assessments may have excluded some of these individuals from the prevalent population. However, the HDSS score categorization provides support for the prevalence estimates presented here and indicates that approximately one third of individuals with axillary hyperhidrosis in the United States are severe cases and sweating is barely



**Fig 2.** Diagram of survey process and primary results. *HDSS*, Hyperhidrosis Disease Severity Scale.

tolerable or intolerable and frequently or always interferes with daily activities.

Surveys that rely on responses from participants are inherently subject to the possibility of recall bias, which may impact the findings. The question used to estimate the prevalence of hyperhidrosis in this study focused on the respondents' current disease characteristics and, therefore, should not be subject to concern over recall bias. However, the wording of the question did not specify a particular recall time period (ie, within the past 2 weeks). This could have lead to a recall bias, whereby participants responded based on their recall of a context in which they believed they had experienced excessive or abnormal/unusual sweating (ie, a particularly hot summer month). However, January administration of this survey significantly decreased the likelihood of this recall bias because it is the coolest part of the year and respondents were least likely to recollect or anticipate their experiences with hot weather while completing the survey.

The administration of this survey depended on one reporter per household (usually the female head of the household) to provide responses for other members of the household, which was a very useful way to increase the study sample size. However, this

could have introduced a source of recall bias, if when responding on behalf of other household members, household reporters had a tendency to reflect their own disease characteristics rather than those solely of the other household members. It is unclear how likely this is or whether this would have lead to an overestimation or underestimation of the prevalence and impact of this disease. In addition, age of onset, discussion of sweating with a health care professional, and the affect of sweating on daily activities were not necessarily focused on the current time period. It is difficult to definitively know if responses to these questions were recalled accurately or whether they were systematically misreported. Concern over this issue is largely diminished by the correlation of *HDSS* score with the affect of sweating on daily activities and discussion of sweating with a health care professional.

## CONCLUSIONS

The hyperhidrosis prevalence estimates provided by this survey indicate that this disease affects a much larger proportion of individuals in the United States than previously thought (7.8 million individuals or 2.8% of the population). Approximately half of these individuals have axillary hyperhidrosis (4 million individuals or 1.4% of the population) and a large proportion (1.3 million individuals or 0.5% of the population) have sweating that is barely tolerable and frequently interferes or is intolerable and always interferes with daily activities. In addition, although a range of treatment options is available, a minority of patients with axillary hyperhidrosis consults their health care provider about sweating. This survey indicates that, for individuals with axillary hyperhidrosis, sweating can have economic implications that affect workplace productivity (particularly because it affects individuals during prime employment years). The results suggest that in axillary hyperhidrosis, sweating often impedes normal daily activities and can result in occupational, emotional, psychological, social, and physical impairment in a substantial proportion of individuals.

## REFERENCES

1. Stolman LP. Treatment of hyperhidrosis. *Dermatol Clin* 1998; 16:863-9.
2. Atkins JL, Butler PE. Hyperhidrosis: a review of current management. *Plast Reconstr Surg* 2002;110:222-8.
3. Hashmonai M, Kopelman D, Assalia A. The treatment of primary palmar hyperhidrosis: a review. *Surg Today* 2000;30: 211-8.
4. Adar R, Kurchin A, Zweig A, Mozes M. Palmar hyperhidrosis and its surgical treatment: a report of 100 cases. *Ann Surg* 1977;186:34-41.
5. Leung AK, Chan PY, Choi MC. Hyperhidrosis. *Int J Dermatol* 1999;38:561-7.

6. Fast A. Reflex sweating in patients with spinal cord injury: a review. *Arch Phys Med Rehabil* 1977;58:435-7.
7. Blair DI, Sagel J, Taylor I. Diabetic gustatory sweating. *South Med J* 2002;95:360-2.
8. Sheehy TW. Diabetic gustatory sweating. *Am J Gastroenterol* 1991;86:1514-7.
9. Miller M. Patients with troublesome sweating. *J Palliat Care* 1997;13:53-4.
10. Ro KM, Cantor RM, Lange KL, Ahn SS. Palmar hyperhidrosis: evidence of genetic transmission. *J Vasc Surg* 2002;35:382-6.
11. Quraishy MS, Giddings AE. Treating hyperhidrosis. *BMJ* 1993;306:1221-2.
12. Collin J, Whatling P. Treating hyperhidrosis: surgery and botulinum toxin are treatments of choice in severe cases. *BMJ* 2000;320:1221-2.
13. Herbst F, Plas EG, Fugger R, Fritsch A. Endoscopic thoracic sympathectomy for primary hyperhidrosis of the upper limbs: a critical analysis and long-term results of 480 operations. *Ann Surg* 1994;220:86-90.
14. Cina CS, Clase CM. The illness intrusiveness rating scale: a measure of severity in individuals with hyperhidrosis. *Qual Life Res* 1999;8:693-8.
15. Swartling C, Naver H, Lindberg M. Botulinum A toxin improves life quality in severe primary focal hyperhidrosis. *Eur J Neurol* 2001;8:247-52.
16. Tan SR, Solish N. Long-term efficacy and quality of life in the treatment of focal hyperhidrosis with botulinum toxin A. *Dermatol Surg* 2002;28:495-9.
17. Naumann MK, Hamm H, Lowe NJ. Effect of botulinum toxin type A on quality of life measures in patients with excessive axillary sweating: a randomized controlled trial. *Br J Dermatol* 2002;147:1218-26.
18. Campanati A, Penna L, Guzzo T, Menotta L, Silvestri B, Lagalla G, et al. Quality-of-life assessment in patients with hyperhidrosis before and after treatment with botulinum toxin: results of an open-label study. *Clin Ther* 2003;25:298-308.
19. Hurley HJ. Disorders of the sweat glands. In: Orkin M, Maibach HI, Dahl MV, editors. *Dermatology*. Norwalk (CT): Appleton and Lange; 1991. p. 344-8.
20. Glogau RG. Treatment of palmar hyperhidrosis with botulinum toxin. *Semin Cutan Med Surg* 2001;20:101-8.
21. Lillis PJ, Coleman WP III. Liposuction for treatment of axillary hyperhidrosis. *Dermatol Clin* 1990;8:479-82.
22. Vallieres E. Endoscopic upper thoracic sympathectomy. *Neurosurg Clin North Am* 2001;12:321-7.
23. Byrne J, Walsh TN, Hederman WP. Endoscopic transthoracic electrocautery of the sympathetic chain for palmar and axillary hyperhidrosis. *Br J Surg* 1990;77:1046-9.
24. Deming W, Setphan F. On a least squares adjustment of a sampled frequency table when the expected marginal totals are known. *Ann Math Stat* 1940;11:427-44.
25. Deming W. *Statistical adjustment of data*: Mineola (NY): Dover Publications; 1984.
26. Teale C, Hamm H, Naumann M, Roberts G, Kowalski J. Development, validity, and reliability of the hyperhidrosis impact questionnaire (HHIQ) [abstract]. *Qual Life Res* 2002;11:702.

#### RECEIVE TABLES OF CONTENTS BY E-MAIL

To receive the tables of contents by e-mail, sign up through our Web site at:

*<http://www.mosby.com/jaad>*

Choose E-mail Notification.

Simply type your e-mail address in the box and click the *Subscribe* button.

Alternatively, you may send an e-mail message to

*[majordomo@mosby.com](mailto:majordomo@mosby.com)*.

Leave the subject line blank and type the following as the body of your message:

subscribe jaad\_toc

You will receive an e-mail to confirm that you have been added to the mailing list. Note that table of contents e-mails will be sent out when a new issue is posted to the Web site.