

# FACTORS ASSOCIATED WITH HERBAL THERAPY USE BY ADULTS IN THE UNITED STATES

Paula Gardiner, MD; Robert Graham MD, MPH; Anna T.R. Legedza, ScD; Andrew C. Ahn, MD, MPH

David M. Eisenberg, MD; Russell S. Phillips, MD

**Objective** • To examine the patterns of herbal therapy use among adults in the United States and to describe factors associated with herb use.

**Design** • We examined the use of natural herbs from the 2002 National Health Interview Survey (NHIS). We analyzed factors associated with herb use and reasons for herb use with logistic regression.

**Results** • Factors associated with herb use include the following: age (45-64 years old), being uninsured, being female, having a higher education, living in the West, using prescription medications or over-the-counter (OTC) medications, and self-identified as "non-Hispanic other." Factors associated with no herb use include being non-Hispanic black and living in the South or Midwest. Seventy-two percent of those who used herbs used prescription medications, and 84% of those who used herbs also used

an OTC medication in the prior 12 months. Among adults who used herbs, the most commonly mentioned were echinacea (41%), ginseng (25%), ginkgo (22%), and garlic (20%). The most frequent conditions for herb use were head or chest cold (30%), musculoskeletal conditions (16%), and stomach or intestinal illness (11%). Among those who used herbs in the prior year, factors associated with using herbs because conventional medical treatments were too expensive included being uninsured, having poor health, and being 25-44 years old.

**Conclusions** • Nearly 1 in 5 people in the US population report using an herb for treatment of health conditions and/or health promotion. More than half did not disclose this information to a conventional medical professional. (*Altern Ther Health Med.* 2007;13(2):22-28.)

**Paula Gardiner, MD**, is a research fellow in the Division for Research and Education in Complementary and Integrative Medical Therapies at Harvard Medical School (HMS) and in the Division of General Medicine and Primary Care at Beth Israel Deaconess Medical Center (BIDMC), in Boston, Mass. At the time this article was written, **Robert Graham MD, MPH**, was a research fellow in Complementary and Integrative Medical Therapies at HMS and in the Division of General Medicine and Primary Care at BIDMC; he is currently director of the walk-in clinic at Mount Auburn hospital in Boston. **Anna T.R. Legedza, ScD**, is a statistician in the Division for Research and Education in Complementary and Integrative Medical Therapies at HMS and in the Division of General Medicine and Primary Care at BIDMC. **Andrew C. Ahn, MD, MPH**, is a junior faculty member in the Division for Research and Education in Complementary and Integrative Medical Therapies at HMS. **David M. Eisenberg, MD**, is the Bernard Osher Associate Professor of Medicine in the Division for Research and Education in Complementary and Integrative Medical Therapies at HMS and an associate professor in Medicine at the of General Medicine and Primary Care at BIDMC. **Russell S. Phillips, MD**, is chief of the Division of General Medicine and Primary Care at BIDMC.

According to the National Institute of Health's Office of Dietary Supplements, products made from botanicals that are used to maintain or improve health may be called herbal products, botanical products, or phytochemicals.<sup>1</sup> Herbal products are a unique class of dietary supplements because they are derived from medicinal plants and not regulated in the United States like pharmaceuticals are. The National Health Interview Survey (NHIS) refers to these products as "natural herbs." Few studies have examined the US adult population's use of herbal products and factors associated with herb use. In 1990, 2.5% of the US population used 1 or more herbal products.<sup>2</sup> In 1997, 42% of the American population used some form of complementary and alternative medicine (CAM), with 12% of the population using herbal medicine.<sup>3</sup> Tindle et al noted an increasing trend of herb use from 1997 to 2002.<sup>4</sup> Various analyses of the NHIS have estimated 10% to 19% of the US population uses herbs for health conditions.<sup>4,8</sup>

Despite widespread use, little is known about patterns of herb use and why patients choose to use herbs. Using data from a nationally representative survey, we examined overall prevalence and patterns of herb use by US adults, factors associated with herb use, prevalence of specific herb use, medical condi-



tions for which herbs are most commonly used, perceived helpfulness, and rates of disclosure to healthcare professionals.

## METHODS

### Data Source

We analyzed data from the Sample Core component and the Alternative Health Supplement to the 2002 NHIS. The alternative medicine supplement was administered as part of the sample adult questionnaire of the 2002 NHIS. The NHIS is an in-person household survey conducted by the Census Bureau for the National Center for Health Statistics and the principal source of information in the United States on the health of the civilian, non-institutionalized household population. One adult (ages 18 years or older) was randomly selected from each household to complete this portion of the survey. There were 31,044 completed interviews, with a 73.4% response rate. The sampling methods for the NHIS are described elsewhere.<sup>9</sup>

### Use of Natural Herbs

The Alternative Medicine Supplement solicited information from US adults on 19 non-conventional health therapies. The primary therapy we examined was natural herb use, defined by the NHIS as "natural herbs with medicinal properties."<sup>9</sup> For the purpose of this analysis, we will use the nomenclature specified in the NHIS and refer to herbal products as "natural herbs." The respondents were specifically asked, "Some people use natural herbs for a variety of health reasons. Some people drink an herbal tea to remedy a flu or cold. Others take a daily pill to help with a health condition or just stay healthy. Have you ever used natural herbs for your own health or treatment (for example ginger, echinacea or black cohosh including teas, tinctures, and pills)?" Respondents who answered "yes" were asked, "During the past 12 months, did you use natural herbs for your own health or treatment?" Respondents who answered "yes" were asked a series of questions about specific health problems or conditions and which of these conditions were helped by use of natural herbs. Respondents chose from a list of 35 dietary supplements used for health reasons (29 supplements were plant-based; 6 supplements were not plant-based, including SAM-e, progesterone cream, melatonin, bee pollen, fish oil, and glucosamine with or without chondroitin). We chose to exclude the 6 non-plant-based supplements from our analysis in order to focus exclusively on plant-based herbs or medicinal plants. Herbal products are a unique class of dietary supplements—patients tend to use them in a traditional or cultural context, and the key constituents of products can vary due to different growing conditions and processing.<sup>8</sup> Respondents also were asked if they disclosed natural herb use to conventional medical professionals including physicians, nurse practitioners, physician assistants, psychiatrists, and dentists.

### Reasons for Natural Herb Use

Among herb users, respondents were asked, "For which of the following reasons did you choose natural herbs: (a) conventional medicine treatment (CMT) was too expensive; (b) natural

herbs combined with conventional medical treatment would help you; (c) a conventional medical professional (CMP) suggested you try natural herbs; (d) you thought it would be interesting to try natural herbs; and/or (e) You thought a conventional medicine treatment would not help you?"

### Other Health-Related Factors

We considered sociodemographic information on respondents' age (18-24, 25-34, 35-44, 45-54, 55-64, ≥65); gender; marital status (married or not married); education (<high school, high school graduate, some college, college graduate); annual family income (<\$15,000, \$15,000-34,999, \$35,000-64,999, ≥\$65,000); race/ethnicity (Hispanic, non-Hispanic white, non-Hispanic black, non-Hispanic other, Asian, American Indian/Alaskan native, Asian Indian, Chinese, Filipino); and region of US residence (Northeast, Midwest, South, West). We analyzed health utilization data on the following: health insurance status (insured or not insured); usual source of medical care (place for routine and preventative care); and utilization of health services (last visit to health professional). We included self-perceived health status (excellent, very good, good, fair, poor). Additionally, we included use of prescription and over-the-counter (OTC) medications in the past 12 months.

### Statistical Analysis

Population estimates were calculated using NHIS weights, which are calibrated to US 2000 census totals for gender, age, and race/ethnicity of the 2002 US population. Descriptive statistics were used to examine the prevalence of herb use, the most common herbs used, medical conditions for which herbs were used, perceived helpfulness of those specific medical conditions, disclosure to medical professionals, and insurance coverage. We used chi-squared tests to compare proportions of characteristics in herb users versus non-users. We used bivariable and multivariable logistic regression analysis to assess which variables were significantly associated with herb use adjusting for race, age, gender, education, income, region, insurance status, usual source of healthcare, last visit to a health professional, self-reported health status, and OTC and prescription medication use. Among herb users, 5 multivariable logistic models were completed for the 5 specific reasons for herb use adjusting for race, age, gender, education, income, region, insurance status, usual source of health care, self-reported health status, and OTC and prescription medication use. We selected variables for testing in our logistic model based on the results of previous national studies and entered these variables into the final model simultaneously.

The variables tested in our model are listed in Table 1. All analyses were performed using SAS-callable SUDAAN version 8.1 (Research Triangle Institute, Research Triangle Park, NC) to account for the complex sampling design of the NHIS.

## RESULTS

### Baseline Characteristics of Respondents

Of the 31,044 respondents, 7,655 (25%) were self-identified



**TABLE 1** Baseline Characteristics of Respondents Who Used or Did Not Use Herbs in the Past 12 Months

Characteristics	During the past 12 months, did you use an herb for your own health or treatment?		P value <.05 is significant
	% Yes	% No	
Population	18.6 n=5,787	81.4 n=25,257	
Race/Ethnicity			<.0001
Hispanic	10.1	11.2	
Non-Hispanic white	75.5	72.6	
Non-Hispanic black	8.7	12.0	
Non-Hispanic other*	5.7	4.2	
Age (yrs)			<.0001
<24	11.3	13.7	
25-34	18.6	17.7	
35-44	22.7	21.0	
45-54	22.5	18.1	
55-64	13.8	12.1	
>65	11.1	17.8	
Sex			<.0001
Male	42.3	49.3	
Female	57.7	50.7	
Education Level			<.0001
< High school	9.2	18.0	
High school graduate	21.2	27.4	
Some college	35.2	31.2	
College graduate	34.0	21.9	
Income (\$)			<.0001
<15,000	14.6	13.3	
15,000-34,999	21.9	18.8	
35,000-64,999	18.3	13.9	
>65,000	9.0	5.8	
Did not reply	36.1	48.2	
Region			<.0001
Northeast	19.7	19.2	
Midwest	23.1	24.7	
South	31.8	38.2	
West	25.4	17.9	
Medical insurance			.16
Yes	86.3	85.4	
No	13.8	14.6	
Usual source of medical care			.04
Yes	88.8	87.1	
No	11.2	12.0	
Last visit to health professional			<.0001
≤6 mos	72.7	67.2	
>6 mos, ≤1yr	13.1	13.9	
>1 yr, never saw	14.3	17.5	

(Table continued)

**TABLE 1** Baseline Characteristics of Respondents Who Used or Did Not Use Herbs in the Past 12 Months

Characteristics	During the past 12 months, did you use an herb for your own health or treatment?		P value <.05 is significant
	% Yes	% No	
Self-perceived health status			.0002
(Excellent, very good, good)	89.2	87.4	
(Fair, poor)	10.7	12.5	
Over-the-counter (OTC) medication			<.0001
Yes	84.3	74.4	
No	15.7	22.7	
Prescribed medication			<.0001
Yes	72.3	33.4	
No	27.1	63.8	

\* (Asian, American Indian/Alaskan native, Asian Indian, Chinese, and Filipino)

as ever having used an herb for their own health and treatment. Of these, 5,787 (19 %) of respondents (extrapolated for the US adult population, 38,182,843) reported using an herb for their own health and treatment. Ten percent of respondents reported ever having seen an herb practitioner, and 5% of respondents had seen an herb practitioner within the past year.

We compared respondents who use herbs for their own health and treatment to those who did not by socio-demographic characteristics, health status, and use of medical services. Differences between users and non-users were small but statistically significant at ( $P<.05$ ) for socio-demographic characteristics, health status, and use of medical services, but not for insurance type (Table 1). Eighty-four percent (32,193,416, weighted for US population) of those who used herbs also used an OTC medication in the prior 12 months, and 21% of OTC-medication users took herbs in the prior 12 months. Coincidentally, 72% (27,605,577, weighted for US population) of those who use herbs also used a prescription medication in the prior 12 months, and 21% of prescription-medication users took herbs in the prior 12 months.

#### Multivariable Analysis of Characteristics Associated With Herb Use

Factors most strongly associated with herb use in the multivariable model included age 45-64 years old; uninsured, female, and living in the West compared to living in the Northeast; use of prescription medications or OTC medications in the prior 12 months, non-Hispanic other (Asian, American Indian/Alaskan native, Asian Indian, Chinese, and Filipino); and greater than a high school education. Factors less associated with herb use included: being non-Hispanic black and living in the South or Midwest (Table 2).

**TABLE 2** Multivariable Analysis of Characteristics Associated With Herb Use

Characteristics	Use of CAM: Prevalence of adjusted odds ratios* (95% confidence interval)
Race/Ethnicity	
Non-Hispanic white	1.0
Non-Hispanic black	0.85 [0.77, 0.95]†
Hispanic	1.09 [0.97, 1.22]
Non-Hispanic other **	1.24 [1.03, 1.49]†
Age, y (%)	
<25	1.0
25-34	1.04 [.90, 1.19]
35-44	1.12 [.99, 1.27]
45-54	1.27 [1.12, 1.45]†
55-64	1.26 [1.09, 1.46]†
>65	0.91 [0.78, 1.07]
Sex	
Male	1.0
Female	1.36 [1.26, 1.46]†
Education Level	
<High school	1.0
High school graduate	1.47 [1.29, 1.67]†
Some College	2.04 [1.80, 2.31]†
College graduate	2.69 [2.34, 3.11]†
Income (\$)	
<15,000	1.0
15,000-34,999	1.02 [0.90, 1.15]
35,000-64,999	1.03 [0.90, 1.18]
>65,000	1.07 [0.92, 1.26]
Region	
Northeast	1.0
Midwest	.88 [0.79, 0.99]†
South	0.83 [0.75, 0.93]†
West	1.41 [1.26, 1.58]†
Medical insurance	
Yes	1.0
No	1.24 [1.11, 1.39]
Usual source of medical care	
Yes	1.0
No	1.11 [.98, 1.26]†
Last visit to health professional	
≤6 mos	1.0
>6mos, ≤1yr	.91 [0.82, 1.00]
>1 yr, never saw	.93 [.82, 1.05]
Self-perceived health status (Excellent, very good, good) (fair, poor)	1.0
Over-the-counter medication	1.09 [.97, 1.22]
Yes	1.46 [1.32, 1.62]†
No	1.0
Prescribed medication	
Yes	1.27 [1.15, 1.39]†
No	1.0

The denominator for the statistics exclude people with unknown CAM information.

\*The prevalence odds ratios (PORs) were calculated from logistic coefficients.

\*\*Asian, American Indian/Alaskan native, Asian Indian, Chinese and Filipino

†Statistically significant

### Among Herb Users, Use of Specific Herbs in the Last 12 Months

We computed the frequency of use of the 29 single herbs included in the NHIS. Of respondents who used herbs for their own health or treatment, herbs most commonly used were echinacea (41%), ginseng (25%), ginkgo biloba (22%), garlic (20%), St John's wort (12%), peppermint (12%), ginger (11%), soy (10%), ragweed/chamomile, (9%) and kava kava (7%) (Table 3).

### Patterns of Herb Use to Maintain Health or to Treat Specific Conditions, and Reported Helpfulness

The most frequent conditions for which herbs were used, ranked highest to lowest, include head or chest cold, musculoskeletal conditions, stomach or intestinal illness, anxiety/depression, insomnia, severe headache or migraine, menopause, cholesterol, and recurring pain. Of the previous conditions, those most frequently rated as "helped a great deal," ranked highest to lowest, include stomach or intestinal illness, menopause, insomnia, recurring pain, severe headache or

**TABLE 3** Among Herb Users, Specific Herbs Used During the Prior 12 Months for Health Reasons (N = 5,787)

Dietary supplement	Weighted %	Estimated number of US population, in thousands
Echinacea	41.0	14,665
Ginseng	24.5	8,777
Ginkgo biloba	21.5	7,679
Garlic supplements	19.9	7,096
St John's wort	12.2	4,390
Peppermint	12.0	4,308
Ginger supplements	10.5	3,768
Soy supplements	9.7	3,480
Ragweed/chamomile	8.7	3,111
Kava kava	6.8	2,441
Valerian	5.9	2,131
Saw palmetto	5.7	2,054
Evening primrose	4.7	1,686
Black cohosh	4.2	1,510
Ma huang (ephedra)	4.1	1,474
Licorice	4.1	1,469
Milk thistle	3.5	1,255
Guarana	3.0	1,085
Comfrey	2.6	938
Feverfew	2.4	865
Dong quai/don gui tong kwei	2.3	815
Hawthorn	2.1	733
Cascara sagrada	1.9	663
Yohimbe	1.8	633
Bladderwrack/kelp	1.4	497
Senna	1.0	361
Mexican yam cream	.71	254
Chaparral	.69	246
Chasteberry/Vitex	.50	179

\*Herbal names are exactly as noted in NHIS survey



migraine, musculoskeletal conditions, cholesterol, head or chest cold, and anxiety/depression (Table 4).

### Disclosure of Herb Use to Conventional Health Providers in the Past 12 Months

Thirty-four percent of respondents disclosed their herb use to conventional medical professionals, and 58% did not, with 8% noting they did not go or talk to a conventional professional in the past 12 months. Of the 34% reporting disclosure, 97% told their medical doctor, 9% told their nurse practitioner or physician assistant, 3% told their psychiatrist, and 3% told their dentist.

### Multivariable Analysis Examining Reasons for Herb Use in the Past 12 Months

Among herb users, 28% felt that herb use was very important in maintaining health and well-being, while 30% thought it was somewhat important, 28% thought it was slightly important, and 14% thought it was not at all important. In the logistic multivariate analysis, factors associated with using herbs because CMT was too expensive were uninsured, poor/fair self-reported health status, and age 25-44 years old. Respondents who chose to use natural herbs because herbs combined with CMT would help were more likely to be college-educated prescription-medication users and less likely to have a usual source of healthcare. For the statement, "a conventional medical professional (CMP) suggested you try natural herbs," respondents were more likely to be prescription medications users of poor/fair self-reported health status, and over age 25 (Table 5). With the exception of poor/fair self-reported health status, no statistically significant difference was noted in the multivariable logistic model for the outcome, "herb use associated with conventional medicine treatment being not helpful." No statistically significant difference was noted in the multivariable logistic model for the outcome "herb use associated with an interest in trying herbs" except for region—respondents from the South were more likely to answer "yes" compared to the reference group from the Northeast.

### DISCUSSION

In 2002, nearly 1 in 5 US adults (that is, more than 38 million adults) used an herb for their own health or treatment during the prior 12 months. There is little known about what factors and personal reasons US adults choose to use herbs. Factors associated with the use of herbs in the last 12 months included age 45 to 64, being uninsured, being female, living in the West, using prescription or OTC medications, being of non-Hispanic other race/ethnicity, and having greater than a high school education. A majority of herb users also were using prescription medication and OTC medications in the prior 12 months. The herbs used most commonly were echinacea, ginseng, ginkgo biloba, and garlic. The most frequent conditions for herb use were head or chest cold, musculoskeletal conditions, and stomach or intestinal illness. More than half of respondents who used both herbs and prescription medications during the previous 12 months did not tell any of their CMPs about their herb use. Fifty-eight percent of subjects did not inform any CMPs about their use of herbs. Herb users who were uninsured, reported poor/fair health status, and were 25 to 44 years old were more likely to use herbs because a CMT was too expensive.

Since 1990, the percentage of the US population using herbs has increased from 2.5% to approximately 19%.<sup>2,7</sup> Our estimate for the prevalence of herb use in the US population is consistent with other large-scale national surveys.<sup>4,7,8,10</sup> However, regional and past national studies have found different rates of use of specific herbs, particularly in racially and ethnically diverse populations.<sup>6,11-13</sup>

Factors associated with herb use shown in other national studies included being middle-aged, being female, having greater than a high school education,<sup>14,15</sup> being uninsured,<sup>6</sup> living in the West,<sup>10</sup> and using prescription or OTC medications.<sup>16</sup> These reports are similar to what we have reported. Among the elderly in the United States, herb use was greatest among females, non-Hispanic ethnic minorities, and those with a higher income, and more years of education.<sup>17</sup> In our study, we did not look specifi-

TABLE 4 Among Users of Herbs to Treat Specific Health Problems or Conditions, Percent Using Herbs, and Reported Helpfulness (N= 3,315)

Condition	N	% Use	% Degree of Help			
			A great deal	Some	Only a little	Not at all
Head or chest cold	961	29.8	35.2	43.9	15.8	5.1
Musculoskeletal conditions*	542	16.4	38.3	36.8	15.7	9.3
Stomach or intestinal illness	389	10.6	51.0	35.0	9.8	4.2
Anxiety/depression	213	5.5	28.4	33.1	27.7	10.9
Insomnia	165	4.8	39.5	39.4	11.0	10.1
Severe Headache or Migraine	130	4.2	38.3	46.5	8.1	7.1
Menopause	93	2.7	39.8	38.7	18.2	3.24
Cholesterol	80	2.6	36.6	40.2	10.4	12.7
Recurring pain	70	2.0	39.0	33.8	14.8	12.4

\* Musculoskeletal conditions include (1) back pain or problem, (2) neck pain or problem, (3) arthritis, gout, fibromyalgia, lupus, (4) knee problem (not arthritis or joint injury), and (5) joint pain or stiffness

TABLE 5 Multivariable Analysis of Factors Associated With Specifics Reasons Respondents Used Herbs

	CMT* Too Expensive; Odds Ratio (Confidence Interval)	Herbs Combined With CMT Would Help You; Odds Ratio (Confidence Interval)	A CMP** Suggested You Try Herbs; Odds Ratio (Confidence Interval)
Age (yrs)			
<25	1.0	NSS†	1.0
25-34	1.75 (1.06-2.88)		2.03 (1.08-3.80)
35-44	1.96 (1.20-3.18)		2.31 (1.29-4.13)
45-54	1.45 (.88-2.40)		2.07 (1.17-3.67)
55-64	1.59 (.94-2.69)		2.43 (1.31-4.52)
≥65	1.24(.66-2.32)		2.52 (1.32-4.80)
Education level			
< High school	1.0	1.0	NSS
High school graduate	.82 (.54-1.26)	1.14 (.84-1.56)	
Some college	.84 (.57-1.23)	1.22 (.92-1.61)	
College graduate	.65 (.42-.99)	1.61 (1.13-2.30)	
Income (\$)			
<15,000	1.0	NSS	NSS
15,000-34,999	1.06 (.76-1.48)		
35,000-64,999	.58 (.38-.88)		
≥65,000	.31 (.14-.70)		
Other	.81 (.60-1.0)		
Medical insurance			
Yes	1.0	NSS	NSS
No	5.39 (4.01-7.24)		
Usual source of medical care			
Yes	NSS	1.0	NSS
No		.50 (.37-.69)	
Self-reported health			
Excellent, very good and good	1.0	NSS	1.0
Fair to poor	1.86 (1.38-2.52)	1.80 ( 1.47-2.20)	1.56 (1.15-2.11)
Prescribed medication		1.0	
Yes	Not Statistically Significant		1.55(1.15-2.08)
No			1.0

Note: Multivariable models adjusted for race, age, sex, income, education, region, insurance status, usual source of health care, self-perceived health status, and OTC and prescribed medication use. Variables that were tested but were not statistically significant on any question include gender, race, region, and OTC medication use. Only variables that had statistically significant findings are reported.

\*CMT=Conventional medicine treatment

\*\*CMP=conventional medical professional

†NSS=Not statistically significant

cally at the elderly; however, we did find that Asians used more herbs, yet the trend was reversed for African Americans, as has been demonstrated in other analyses.

The most frequent conditions for which herbs were used include both acute (head or chest cold and stomach or intestinal illness) and chronic conditions (musculoskeletal conditions, ie, back pain, neck pain, arthritis, gout, fibromyalgia, lupus, knee problems, joint pain, or stiffness). This is inconsistent with previous national studies, which reported that the most frequent medical conditions for herb use were upper respiratory infections, arthritis, depression, musculoskeletal pain, memory improvement, and menopausal symptoms.<sup>14,16,18</sup> The conditions for which herbs are rated most helpful include stomach or intestinal ill-

ness, menopause, insomnia, recurring pain, severe headache or migraine, musculoskeletal conditions, cholesterol, head or chest cold, and anxiety/depression.

Among herb users, 72% also used prescription medications, and 84% used an OTC medication in the prior 12 months. Although we cannot be sure these data reflect concurrent use, more than 27 million of people living in the United States might be taking an OTC medication and an herb or a prescription medication and an herb concurrently. In 1997, an estimated 15 million people took herbal remedies and high-dose multivitamins concurrently with prescription medications.<sup>3</sup> Kaufman et al noted that 16% of prescription drug users also reported use of one or more herbals/supplements within the prior week.<sup>16</sup> Increasing numbers



of reports describe clinically serious interactions between prescription drugs and herbs/supplements and concern that the problem of adverse effects may be under-reported has grown.<sup>16,19-25</sup>

In our study, nearly 60% of respondents who used herbs did not tell a CMP about their herb use, and this has been seen in other analyses. More than half of respondents who used both herbs and prescription or OTC medications did not tell any of their CMPs about their herb use. In other national and smaller cross-sectional surveys, approximately 35% to 44% of those who take dietary supplements regularly did not share this information with a healthcare provider.<sup>3,18,26</sup> The rate of non-disclosure has not changed significantly since the early 1990s, despite media attention and more marketing of dietary supplements.<sup>16,19-25</sup>

In our analysis, reasons for herb use focused on the cost of conventional medicine, the benefits of combined conventional medicine treatment and herbs, and suggestions from healthcare professionals. Our analysis confirms Barnes et al's finding that most herb users do not choose to use herbs because of lack of confidence in CMT.<sup>7</sup> Only those with poor/fair self-reported health status used herbs because "conventional medicine would not help." To our knowledge, this is the first time that the characteristic of being uninsured, of poor/fair health status, and 25 to 44 years old have been correlated with herb use as a result of the conventional medicine expense. Finally, respondents who used prescription medication, those older than 25 years of age, and those with fair/poor health status were more likely to choose herbs because a conventional provider suggested it.

It is difficult to compare our estimates of prevalence of herb use to market data provided by manufacturers for several reasons. First, the NHIS did not ask about all the herbs with substantial market share. In addition, the accuracy of estimates based on industry marketing and product surveillance are difficult to verify.<sup>27</sup> The NHIS included questions on the following herbs (top-selling herbs based on 1998 and 2002 market data and survey data): garlic, ginkgo biloba, St John's wort, ginseng, echinacea, saw palmetto, kava kava, valerian, evening primrose, soy, and black cohosh.<sup>16,28,29</sup> However, of the top-selling herbs in 1998 and 2002, the NHIS did not ask about the use of green tea, bilberry, grapeseed, cranberry, aloe, and goldenseal or about herbs commonly used by racial and ethnic minorities.<sup>16,29,30</sup>

### Study Limitations

There are several limitations to our analysis. First, the survey is based on self-reported data; thus, subjects may be under- or over-reporting their use of herbs. The term natural herbs (rather than herbal medications or herbal products) might have been misunderstood by respondents. Respondents who did not use natural herbs, such as herbs in a tablet or capsule, might not have disclosed use. The survey listed only 29 herbs, although there are thousands of botanicals sold as combination dietary supplements or ethnic traditional medicines in the United States. Additionally, many herbs have unique common names based on the region or cultural background. Despite the improved sampling and collection strategies employed by the

NHIS to capture ethnic minority responses, there appears to be both ethnocentric and medico-centric bias in the survey instrument, which may have contributed to an underestimation of the prevalence of CAM and herb use in particular, especially among non-white ethnic groups.<sup>8,31</sup> Further research is needed to explore why patients are not disclosing their herbal product use to conventional healthcare providers, and strategies to facilitate communication in this area need to be developed.

In conclusion, the use of herbal products by the US population has increased over the last decade. It is unclear whether patterns of herbal therapy use by adults are being influenced by marketing data vs evidence of efficacy vs safety or other factors. Most herb users do not choose to use herbs because of a lack of confidence in CTM, and only those with poor self-reported health status or no insurance use herbs because conventional medicine is not helpful or because it is too expensive. More research about why patients use herbs for acute and chronic conditions as well as the cause for the high rates of nondisclosure is needed. Herbal products have complex mechanisms of action and complicated pharmacokinetics and can interact with prescription medications or cause adverse reactions. For patient safety, healthcare professionals should be aware that not only are their patients using herbal products, but also that the majority of patients are not discussing herb use with them.

### Acknowledgments

The contents of this manuscript are solely the responsibility of the authors and do not necessarily represent the official views of the National Center for Complementary and Alternative Medicine (NCCAM) or the National Institutes of Health (NIH). The authors thank Dr Kathi Kemper and Mark Blumenthal for reviewing earlier revisions of the manuscript. Drs Gardiner, Graham, and Ahn are supported by an NIH Institutional National Research Service Award, Grant No. T32-AT0051-03, from the NCCAM. Dr Phillips is supported by an NIH Mid-Career Investigator Award K24-AT000589 from the NCCAM, National Institutes of Health.

### REFERENCES

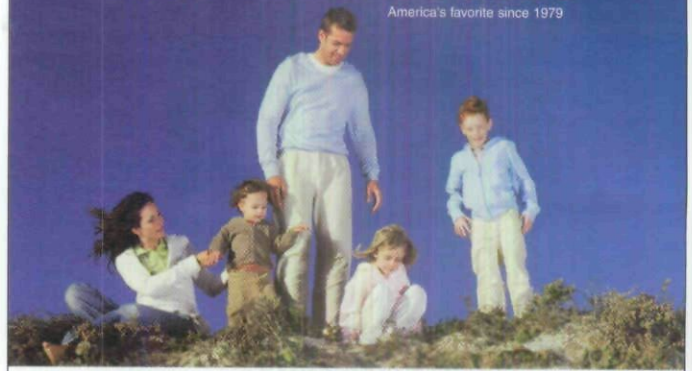
1. National Institutes of Health Office of Dietary Supplements. Botanical Dietary Supplements: Background Information. Available at: <http://ods.od.nih.gov/factsheets/botanicalbackground.asp>. Accessed January 25, 2007.
2. Eisenberg DM, Kessler RC, Foster C, Norlock FE, Calkins DR, Delbanco TL. Unconventional medicine in the United States. Prevalence, costs, and patterns of use. *N Engl J Med*. Jan 28 1993;328(4):246-252.
3. Eisenberg DM, Davis RB, Ettner SL, et al. Trends in alternative medicine use in the United States, 1990-1997: results of a follow-up national survey. [see comment]. *JAMA*. 1998;280(18):1569-1575.
4. Tindle HA, Davis RB, Phillips RS, Eisenberg DM. Trends in use of complementary and alternative medicine by US adults: 1997-2002. *Altern Ther Health Med*. 2005;11(1):42-49.
5. Ni H, Simile C, Hardy AM. Utilization of complementary and alternative medicine by United States adults: results from the 1999 national health interview survey. *Med Care*. 2002;40(4):353-358.
6. Fennell D. Determinants of supplement usage. *Prev Med*. 2004;39(5):932-939.
7. Barnes PM, Powell-Griner E, McFann K, Nahin RL. Complementary and alternative medicine use among adults: United States, 2002. *Adv Data*. May 27, 2004;(343):1-19.
8. Graham RE, Ahn AC, Davis RB, O'Connor BB, Eisenberg DM, Phillips RS. Use of complementary and alternative medical therapies among racial and ethnic minority adults: results from the 2002 National Health Interview Survey. *J Natl Med Assoc*. 2005;97(4):535-545.
9. Survey NHI. CAPI Manual for HIS Field Representatives 2002.
10. Yu SM, Ghandour RM, Huang ZJ. Herbal supplement use among US women, 2000. *J Am Med Womens Assoc*. 2004;59(4):17-24.
11. Harnack LJ, Rydell SA, Stang J. Prevalence of use of herbal products by adults in the Minneapolis/St Paul, Minn, metropolitan area. *Mayo Clin Proc*. 2001;76(7):688-694.
12. Schaffer DM, Gordon NP, Jensen CD, Avins AL. Nonvitamin, nonmineral supplement use over a 12-month period by adult members of a large health maintenance organization. *J Am Diet Assoc*. 2003;103(11):1500-1505.
13. Rivera JO, Chaudhuri K, Gonzalez-Stuart A, Tyroch A, Chaudhuri S. Herbal product



- use by hispanic surgical patients. *Am Surg.* 2005;71(1):71-76.
14. Kelly JP, Kaufman DW, Kelley K, Rosenberg L, Anderson TE, Mitchell AA. Recent trends in use of herbal and other natural products. *Arch Intern Med.* 2005;165(3):281-286.
  15. Bruno JJ, Ellis JJ. Herbal use among US elderly: 2002 National Health Interview Survey. *Ann Pharmacother.* 2005;39(4):643-648.
  16. Kaufman DW, Kelly JP, Rosenberg L, Anderson TE, Mitchell AA. Recent patterns of medication use in the ambulatory adult population of the United States: the Slone survey. *JAMA.* 2002;287(3):337-344.
  17. Bruno JJ, Ellis JJ. Herbal Use Among US Elderly: 2002 National Health Interview Survey. *Ann Pharmacother.* 2005;39(4):643-648.
  18. Blendon RJ, DesRoches CM, Benson JM, Brodie M, Altman DE. Americans' views on the use and regulation of dietary supplements. *Arch Intern Med.* 2005;161(6):805-810.
  19. Ernst E. Herb-drug interactions: potentially important but woefully under-researched. *Eur J Clin Pharmacol.* 2000;56(8):523-524.
  20. Mills E, Montori VM, Wu P, Galliciano K, Clarke M, Guyatt G. Interaction of St John's wort with conventional drugs: systematic review of clinical trials. *Br Med J.* 2004;329(7456):27-30.
  21. Fugh-Berman A, Ernst E. Herb-drug interactions: review and assessment of report reliability. *Br J Clin Pharmacol.* 2001;52(5):587-595.
  22. Sorensen JM. Herb-drug, food-drug, nutrient-drug, and drug-drug interactions: mechanisms involved and their medical implications. *J Altern Complement Med.* 2002;8(3):293-308.
  23. Kuhn MA. Herbal remedies: drug-herb interactions. *Crit Care Nurse.* 2002;22(2):22-28, 30, 32; quiz 34-35.
  24. Valli G, Giardina EG. Benefits, adverse effects and drug interactions of herbal therapies with cardiovascular effects. *J Am Coll Cardiol.* 2002;39(7):1083-1095.
  25. Smolinske SC. Dietary supplement-drug interactions. *J Am Med Womens Assoc.* 1999;54(4):191-192, 195.
  26. Leung JM, Dzankic S, Manku K, Yuan S. The prevalence and predictors of the use of alternative medicine in presurgical patients in five California hospitals. *Anesth Analg.* 2001;93(4):1062-1068.
  27. Blumenthal M. Herbs Continue slide in mainstream market: sales down 14 percent. *HerbalGram.* 2003;58:71.
  28. Blumenthal M. *The ABC Clinical Guide to Herbs.* Austin, Tex: The American Botanical Council; 2003.
  29. Brevoort P. The booming U.S. botanical market. A new overview. *HerbalGram.* 1998;44:33-46.
  30. Rivera JO, Ortiz M, Lawson ME, Verma KM. Evaluation of the use of complementary and alternative medicine in the largest United States-Mexico border city. *Pharmacotherapy.* 2002;22(2):256-264.
  31. Hufford DJ. Cultural and social perspectives on alternative medicine: background and assumptions. *Altern Ther Health Med.* Mar 1995;1(1):53-61.

# 15 Good Reasons to Buy DDS® PROBIOTICS

America's favorite since 1979



## The Powerful Proven Probiotics

### DDS®- PLUS PROBIOTIC CAPSULES

**DESCRIPTION:** DDS® Plus is the source of a special strain Lactobacillus acidophilus (DDS-1 strain), Bifidobacterium longum, and Fructooligosaccharides. DDS® - Plus is free of dairy products, corn, soy and preservatives.

**POTENCY:** Each gram (2 capsules) contains 5 billion viable Lactobacillus acidophilus (DDS-1 strain) and Bifidobacterium longum at the time of manufacturing.

#### INDICATIONS AND USAGES:

As an aid in maintaining normal intestinal flora with beneficial Lactobacillus acidophilus Bifidobacterium longum and under conditions of digestive disorders and following antibiotic therapy. DDS is a registered trademark of UAS Laboratories.



## The Safe & Healthy Choice for Kids & Infants

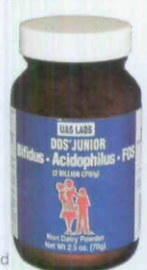
### DDS®- JUNIOR PROBIOTIC FOR CHILDREN

**DESCRIPTION:** DDS® Junior is the source of a special strain Lactobacillus acidophilus (DDS-1 strain), Bifidobacterium infantis, and Fructooligosaccharides. DDS® - Junior is free of dairy products, corn, soy and preservatives.

**POTENCY:** Each gram (1/4 level teaspoon) contains 5 billion viable Lactobacillus acidophilus (DDS-1 strain) and Bifidobacterium infantis at the time of manufacturing.

#### INDICATIONS AND USAGES:

As an aid in maintaining normal intestinal flora with beneficial Lactobacillus acidophilus Bifidobacterium infantis and under conditions of digestive disorders and following antibiotic therapy. DDS is a registered trademark of UAS Laboratories.



## 15 Reasons for DDS PROBIOTICS

1. Contains Superior & Viable (Live) Strains
2. High Potency
3. Non Dairy
4. Human Origin, So Adapts to Human Body
5. Acid & Bile Resistant (Survives Stomach Acid)
6. Produces Hydrogen Peroxide, Lactic Acid & Natural Antibiotics
7. Fortified with Prebiotics (It Is a Synbiotic)
8. Freeze-dried and Packaged with Nitrogen to Improve Stability
9. Stable at Room Temperature for Two Years  
(Refrigeration at 40°F Recommended for Temperature Fluctuation)
10. Available in Veggie Capsules
11. Generally Recognized As Safe (GRAS)
12. Helps Maintain a Healthy Flora
13. Backed by University Research, US Patent & Trademark
14. Listed in Physicians' Desk Reference & Doctor Recommended
15. America's Favorite Probiotic Since 1979

### UAS LABORATORIES

9953 Valley View Road, Eden Prairie, MN 55344, USA

Tel: (800) 422-3371 • Fax: (952) 935-1650

E-mail: [info@uaslabs.com](mailto:info@uaslabs.com) • Website: [www.uaslabs.com](http://www.uaslabs.com)

DDS® Probiotics by UAS Labs are more than multivitamins and are to be taken daily on an empty stomach before breakfast. DDS® Probiotics by UAS Labs meet all the characteristics of a Super Probiotic Supplement & Dr. Dash's TOP PICKS.



Copyright of *Alternative Therapies in Health & Medicine* is the property of InnerDoorway Health Media and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.