

Characteristics Associated with Self-Reported
Diabetes Screening among Oregon Adults

By

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Abstract

Diabetes mellitus is a major public health problem in Oregon and the United States. Despite the increasing burden and serious complications from this disease, there is no clear consensus on whether patients should be screened for diabetes. Three previous studies examined some of the demographic and medical characteristics of those who have been screened. We found no previous published studies that addressed whether characteristics associated with personal beliefs and attitudes about diabetes are related to screening.

Therefore, to better understand characteristics associated with self-reported screening for diabetes mellitus, we conducted a cross-sectional study of adult Oregonians from December 1999 – May 2000 using a random-digit dialed telephone survey. 1038 non-institutionalized adults were interviewed concerning diabetes diagnosis, diabetes screening history, demographics and health status, diabetes family history, diabetes knowledge and attitudes, and health behavior. Data were analyzed in contingency tables to determine the level of association of characteristics with screening for diabetes in the past one year. Characteristics observed to have a Pearson Chi-square of less than 0.20 were further analyzed in a multiple logistic regression model.

We observed a prevalence of diabetes of 5.0% in our study population. Among our respondents without diabetes, 27.7% reported being screened in the past one year. Seven characteristics were observed to be associated with diabetes screening in the prior year with a Pearson Chi-square value of less than 0.20. These were age, family history of diabetes, body mass index, worry about getting diabetes in the next ten years, tobacco use, household income, and snacks eaten weekly. These seven variables were further analyzed, along with meals eaten weekly, to determine independence of association with diabetes screening in the past one year. Only age over 65, BMI over 35.0, and family history of diabetes were observed to be independently associated with screening for diabetes in the past year. Behavioral characteristics, including diet and activity levels, greater knowledge about diabetes, and concern about getting diabetes, were not associated with screening.

Introduction

Diabetes mellitus is a major public health problem in Oregon and the United States. Among Oregon adults, the prevalence of diagnosed diabetes rose from 3.8% in 1990 to 4.7% in 1999, an increase of 24% in nine years.¹ In 1999, an estimated 115,000 Oregon adults reported having diabetes and another 64,000 were estimated to have undiagnosed diabetes.¹ In 1998 diabetes was the seventh leading cause of death on Oregon death certificates. From 1988 to 1998 heart disease mortality rates declined and cancer mortality rates remained stable, whereas diabetes mortality rates rose by 53%.¹

The Oregon experience closely mirrors that of the United States as a whole. The prevalence of diagnosed diabetes among U.S. adults rose from 4.9% in 1990 to 6.9% in 1999.² Direct and indirect health care costs of diabetes in the U.S. in 1997 were estimated to be \$98 billion.³

Much diabetes remains undisclosed until complications are present. It is estimated that up to half of those with type 2 diabetes are undiagnosed,⁴ that the average onset of diabetes is greater than 10 years before it is clinically diagnosed, and that many develop significant microvascular complications, including retinopathy and nephropathy, prior to diabetes diagnosis.⁴

Despite the increasing burden of diabetes mellitus and its serious complications, the issue of screening for this disease is unresolved. The American Diabetes Association (ADA) currently recommends that persons over the age of 45 years, or those over 18 years with specific risk factors be screened for diabetes every three years.⁵ Agreement regarding this recommendation is not

uniform. The United States Preventive Services Task Force considers there to be insufficient evidence to recommend for or against routine screening.⁶ The Canadian Task Force on the Periodic Health Exams considers there to be enough evidence to argue against screening the general non-pregnant population.⁷

These differing opinions center on treatment effectiveness to prevent diabetes complications. The United Kingdom Prospective Diabetes Study (UKPDS) has shown that some microvascular complications of diabetes can be prevented through tight blood sugar control. Yet, this was not observed to be true for prevention of macrovascular complications.⁸ Some argue that because the disease burden of macrovascular complications is much greater than microvascular complications, it would be more effective to screen older age groups for diabetes based on cardiovascular risk factors such as blood pressure and cholesterol.^{9, 10} Another approach, recently presented in a Center for Disease Control and Prevention (CDC) cost effectiveness study would be to screen for diabetes in those younger than 45 years who are at greatest risk for the microvascular complications that come from living with diabetes for many years.¹¹ As yet, no prospective studies have addressed these issues so the benefits and harms of any of the various forms of diabetes screening have not been established.

Despite the lack of evidence showing the benefit of screening for diabetes, much screening is currently taking place. Three previous studies examined some of the demographic characteristics associated with persons who have

recently been screened for diabetes. Data from the 1989 National Health Interview Survey (NHIS) showed that 31% of adults without diagnosed diabetes reported being screened for diabetes in the preceding year. Self-reported screening for diabetes was associated with age, family history of diabetes, weight, and racial and ethnic category.¹² A random-digit dialed telephone survey in 1998 of 1024 Montana adults aged 45 and older found that 39% of these older persons without diagnosed diabetes recalled being screened in the past year, and 53% reported screening within the past three years.¹³ In both these studies,^{12, 13} the prevalence of screening increased with the number of risk factors for diabetes. Analysis of data obtained from medical records of 20,769 members of a large managed care organization in North Carolina showed that 52% of those without diabetes had had at least one form of glycemic testing in the prior three years.¹⁴

While these studies suggest that most screening is associated with ADA diabetes risk criteria such as age and family history, little is currently known about other characteristics of those who have been recently screened for diabetes. We identified no published studies that addressed whether characteristics associated with personal beliefs and attitudes about diabetes are related to screening. There is no information available in Oregon regarding this issue that can be used for public health program planning. Therefore, to describe more clearly the characteristics associated with self-reported screening for diabetes mellitus, we conducted a cross-sectional study of adult Oregonians from December 1999 – May 2000.

Background

In order to better understand characteristics associated with diabetes screening, it will be helpful to first review the principles of screening in general. Next, we will review pertinent aspects of diabetes mellitus pathophysiology and epidemiology. Finally, we will discuss how the general screening principles apply to screening for diabetes.

Screening

Screening is defined as the examination of asymptomatic persons in order to diagnose disease for which treatment in the preclinical phase reduces long-term complications and prevents death. The success of a screening program that results in reduced morbidity or mortality depends upon interrelations between the disease experience of the target population, characteristics of the screening procedures themselves, and the net benefit of treating the pre-clinical disease.¹⁵

Disease and Treatment Characteristics

Certain disease characteristics make it more likely that a screening program will be of benefit. First, morbidity and mortality from the disease should represent a sizeable public health burden. Next, the disease must pass through a pre-clinical, asymptomatic phase during which it would not normally be diagnosed. Third, the disease must be treatable in the preclinical phase to prevent progression, complications, or death. Finally, the treatment regimen needs to be reasonable in cost and personal effort so that those who are diagnosed will be willing and able to carry out whatever needs to be done to prevent disease

progression. The greater the ability of treatment to prevent severe morbidity or mortality, the more important it may be to screen patients for preclinical disease.

Test Characteristics

Screening is appropriate only if tests exist that can detect the preclinical stage of the disease accurately, reliably and economically. Screening tests are most often based on a laboratory or radiologic procedure which will help determine if the patient is more or less likely to have the disease (or a disease risk factor such as high cholesterol). No screening test is perfect. The screening criteria on which a positive test is based can usually be found in some persons with as well as some persons without the disease. Because of the overlap of the test measurement in those with and without the disease, some cutpoint, or criterion for positivity must be set for the test. The probability that a specific test's cutpoint correctly shifts those with true preclinical disease into the "more likely" category is called the sensitivity. The ability of the test to shift those without true disease into the "less likely" category is the specificity of the test. The positive predictive value (PPV) of a test in a screening program in a given population is the proportion of people who have the disease given a positive test, while the negative predictive value (NPV) is the proportion of people who do not have the disease given a negative test. The PPV and NPV are functions of the test sensitivity and specificity as well as the prevalence of the preclinical phase of the disease in the population. The greater the prevalence of the preclinical phase, the more likely a positive test represents disease (higher PPV). Thus, to increase the PPV, populations more likely to have preclinical disease may be

targeted by screening programs. The lower the prevalence of the preclinical phase, the less likely a positive test represents true disease. The opposite relationship is true for NPV.

For the purposes of screening, tests must have sufficient sensitivity and specificity to appropriately minimize false positive and false negative results. Additionally the cost of the test in economic terms as well as patient time, discomfort, and morbidity must be considered when weighing screening programs.

Population Characteristics

Several population characteristics also affect the value of a screening program. As noted earlier, a greater prevalence of the preclinical phase of the disease in a population will increase the public health burden of the disease as well as the likelihood that a screening test will effectively identify those with the condition. Additionally, relevant medical care such as follow-up evaluation or treatment must be accessible to those who screen positive.

Screening programs will only work if the population being screened is willing to participate. The Health Belief Model (HBM) is one theory that attempts to predict personal participation in a health behavior. This model was developed by the U.S. Public Health Service in the 1950s to explain the failure of people to participate in tuberculosis screening programs. The theory states that a person will be more likely to take a preventive health action if they regard themselves as susceptible to the condition (perceived susceptibility), believe that it has serious consequences (perceived severity), believe that some course of action available

to them would help to reduce their susceptibility to or severity of the condition (perceived benefits), and if they believe that anticipated barriers (or costs of) taking the action are outweighed by the benefits (perceived barriers).¹⁶ A 1984 review of several HBM-related studies showed that with regard to preventive health and screening behaviors, perceived susceptibility and perceived barriers were most strongly associated with undergoing screening.¹⁷

Personal barriers to, and costs of, screening can be real as well as perceived. Cost can result in several ways other than the up front economic cost of the test. First, the potential for false positive tests can result in healthy persons being told they may be ill; they may be advised to undergo uncomfortable, costly, or invasive diagnostic testing. Second, even if testing is accurate, screening can result in greater harm than good if treatments are ineffective or harmful. Finally, harm can result from screening because of its "labeling" effect.

In considering the value of screening programs, we must also remember that early diagnosis will always appear to improve survival time even if there is no effective treatment due to three forms of bias: lead-time bias, length time bias, and the healthy volunteer effect. Persons who volunteer for studies and who present to physicians for regular check-ups and screening are likely to be different from those who do not do so in other health behaviors and in life expectancy as well.

Diabetes Mellitus

Diabetes mellitus comprises a heterogeneous group of disorders characterized by high glucose levels. Type 1 diabetes mellitus is characterized

by pancreatic beta cell destruction that leads to an absolute insulin deficiency.¹⁸ Type 2 diabetes mellitus is characterized by hyperglycemia without an absolute insulin deficiency, with the triad of impaired glucose uptake into insulin-sensitive tissues (especially skeletal muscle), increased glucose production by the liver, and impaired insulin secretion.¹⁸ Type 2 diabetes accounts for 90-95% of all diagnosed diabetes in the United States.¹⁹ It is a slowly progressive disease, from genetic predisposition, through the stage of insulin resistance and hyperinsulinemia, to beta cell failure and overt clinical disease, with many patients eventually requiring use of insulin.²⁰

Risk factors for diabetes are demographic, genetic, and behavioral; older age, being in several high-risk racial or ethnic groups, having a family history of diabetes, being obese, and being physically inactive have been shown to be independently associated with developing diabetes.²¹ Hypertension, hyperlipidemia, and polycystic ovarian syndrome are metabolic disorders associated with insulin resistance – their presence increases the likelihood that a patient has, or will develop diabetes.²¹ Impaired glucose tolerance, impaired fasting glucose, and gestational diabetes are considered intermediate disease states; persons with these conditions are more likely to develop type 2 diabetes in the future.²¹

The prevalence of diabetes in the United States rose 33% from 4.9% in 1990 to 6.5% in 1998, numbers most certainly driven by a similarly rising prevalence of obesity.²² While the prevalence of diabetes is much higher in the elderly (12.7% of those 70 years old and older in 1998) the largest increase in prevalence

between 1990 and 1998 was in those 30-39 years old, from 2.1% to 3.7%, an increase of 69.9% in that eight year span.²²

The burden of diabetes in the United States is enormous. According to the CDC National Diabetes Fact Sheet published in 1998, nearly 800,000 new cases of diabetes are identified every year in the United States. Diabetes contributed to 193,140 deaths in 1996, and was the 7th leading cause of death listed on U.S. death certificates.³ The risk of heart disease and stroke is 2 to 4 times higher in persons with diabetes.³ Diabetes is the leading cause of new cases of blindness in adults 20 to 74 years old, causing from 12,000 to 24,000 cases each year.³ It is the leading cause of end-stage renal disease, accounting for about 40% of new cases.³ Over half of leg amputations in the United States occur in persons with diabetes.³ In 1997, \$44 billion were spent on direct medical costs of diabetes and \$54 billion on indirect costs such as disability, work loss, and premature mortality.³

One third of all cases of Type 2 diabetes in the United States are undiagnosed.²⁰ Type 2 diabetes has a prolonged asymptomatic, preclinical phase. It has been estimated that on average, in 1980, it was present for 9 to 12 years before clinical diagnosis in the U.S.²³ During this preclinical phase, microvascular complications are clearly progressing. Studies of those with newly diagnosed type 2 diabetes have shown that from 2% to 39% have retinopathy, 8% to 18% have nephropathy, 5% to 13% have neuropathy, and 8% have cardiovascular disease.²⁴

Screening for Type 2 Diabetes

Currently, the American Diabetes Association recommends testing for diabetes in everyone 45 years old and older, and in younger patients if any of the following characteristics are observed: having a family history of diabetes (parents or siblings with diabetes), obesity, being African-American, Hispanic American, Native American, Asian-American, or a Pacific Islander, being physically inactive, having a past history of impaired fasting glucose or impaired glucose tolerance, having a history of gestational diabetes mellitus or delivery of babies over 9 pounds, having a history of hypertension, having a history of HDL cholesterol less than or equal to 35mg/dl or a triglyceride level greater than or equal to 250mg/dl, or having a history of polycystic ovarian syndrome.⁵ The fasting plasma glucose (FPG) test, and the 75 gram oral glucose tolerance test (OGTT) are recommended for screening, with emphasis placed on the FPG test because of its ease, speed, and low cost.⁵ Positive screening tests must be repeated on a different day to confirm diagnosis.⁵ Those with a normal screening test are recommended to repeat screening every three years.⁵

Partly as a response to improved diabetes treatment, in 1997, the ADA and World Health Organization (WHO) recommended decreasing the cutoff fasting blood glucose level for screening and diagnosis of diabetes from 140mg/dl to 126mg/dl. These changes came about in response to the UKPDS that showed that intensive treatment of blood glucose over the first 10 years after diagnosis reduced the frequency of microvascular complications by up to 25%.²⁵

However, much of the disagreement about the value of diabetes screening results from lack of evidence that early treatment substantially improves

outcomes. While the UKPDS demonstrated that aggressive treatment of diabetes could prevent microvascular complications, the study did not show a statistically significant effect of tight blood sugar control on macrovascular endpoints. Most mortality from diabetes results from these macrovascular consequences. Over the past 30 years, heart disease deaths have declined substantially in the United States, but much less so in those with diabetes.²⁶ This has led some to advocate screening for diabetes based upon cardiovascular risk factors, such as testing for diabetes as part of work-up for hypertension and hyperlipidemia.^{9, 10, 27}

Summary

In summary, the value of a screening program is dependent upon factors having to do with the screening test itself, the disease being screened for, and the population being screened. There is no consensus whether or how to perform routine population based screening for diabetes. Despite this, many are currently being screened. Three previous studies have examined the demographic and diabetes risk characteristics of persons currently being screened for diabetes.

The purpose of our study is to determine personal characteristics associated with self-reported screening for diabetes. We analyzed data from a recent random population survey in Oregon to assess several knowledge, risk, attitudinal as well as demographic and risk factors and their relationship to screening for diabetes. Previous studies have demonstrated that screening for diabetes is associated with greater number of ADA risk factors. Applying the Health Belief Model to diabetes screening, it would follow that screening would

be associated with those who think diabetes is serious and who feel more susceptible to getting diabetes. It would also seem reasonable that those with better general health habits would be more likely to be screened, a characteristic which could also have an effect upon treatment compliance. The decision to screen for diabetes might result from health care providers and their knowledge of diabetes screening recommendations. Alternatively, patients' personal knowledge, attitudes, and concerns may be associated with screening self-report. Such distinctions are important to our understanding of the descriptive epidemiology of screening for type 2 diabetes in Oregon.

Methods

Study Design and Sampling

The Oregon Diabetes General Knowledge Survey was designed to assess attitudes and knowledge about diabetes among adult Oregonians as well as factors that might influence these. The survey was developed to guide public health planning activities related to diabetes and to enhance surveillance for diabetes in the state. Data were collected from December 1, 1999 through May 31, 2000. The Oregon Health Division contracted Clearwater Research, Inc. of Boise, Idaho to conduct the survey using computer assisted telephone interviewing (CATI) technology.

Oregon adults ages 18 years or older who spoke English, and were not residing in institutional settings comprised the survey population. Random-digit dialing was employed to identify residential households from which an adult could be sampled. Every three months, the survey vendor purchased batches of

telephone numbers from which business, disconnected, and unassigned numbers were removed. All remaining telephone numbers were assigned to one of two 'banks': '1+ banks' known to contain at least one residential telephone number and '0 banks' not known to contain a residential telephone number. During the study period, three batches of phone numbers were purchased. On average, the 1+ bank contained 3,126,867 telephone numbers and the 0 bank contained 5,866,467 telephone numbers. These two banks formed the first stage sampling strata. Telephone numbers were sampled randomly from each bank, such that the proportion sampled from the 1+ bank was 4 times greater than the proportion sampled from the 0 bank.

When a randomly dialed telephone number was answered, the CATI interviewer established that a residence had been reached. The household constituted the primary sampling unit. To identify an adult for interview, the interviewer then ascertained the numbers of adult men and adult women in the household. This information was immediately entered into the CATI computer, which identified one adult at random to be interviewed (the second oldest female, for example). The interviewer then either spoke to that specific adult or arranged a time to call back if that adult was not available. If the telephone call was answered by a machine, the interviewer left a brief message stating the purpose of the study and that an attempt to contact an adult member of the household would be made again. Telephone calls were repeated 15 times until a number was discarded and replaced with a new randomly generated number. The answering machine message was left only on the first call. If a respondent

refused to be interviewed or terminated the interview before it was complete, an interviewing supervisor telephoned the respondent in an attempt to achieve a complete survey.

During the study period, 10,000 telephone numbers were dialed at random. Of these, 4,880 were non-working numbers, 1,797 were not residences, 667 were never answered, and at 227 no eligible respondent was available. Of the remaining 2,429 numbers, 95 reached a person unable to communicate with the interviewer (young children or non-English speakers), the respondent refused to be interviewed at 1225, the respondent did not complete the interview at 71, and at 1,038 numbers the respondent completed the interview. Using standard response computations recommended by the CDC, the proportion responding to this survey was 38%.

The length of time of the interviews averaged 17 minutes. Responses were immediately entered into the computer as the interview progressed. The CATI program system had a series of checks such as calculations and range checks that would alert the interviewer if an error in reporting had occurred. Interviewers resolved these discrepancies during the interview. For example, if the reported number of adult males and adult females in the household did not add up to the previously reported number of adults, the interviewer would be instantly alerted to re-question the respondent about this.

Survey Instrument

Our survey included questions about demographics, physical activity, eating patterns, chronic disease attitudes, as well as diabetes diagnosis, awareness,

risk, knowledge and screening (see Appendix A). Many questions were drawn from other surveys. Eating pattern questions were modeled after survey questions designed by the U.S. Department of Agriculture. Physical activity questions were taken from Oregon's annual Behavioral Risk Factor Surveillance System Survey. Diabetes questions were drawn from the National Diabetes Education Program and the Idaho Diabetes Awareness Study.

Interview responses relevant to the study hypotheses were recoded into continuous or categorical variables necessary for analysis. Table 1 indicates the questions asked of participants and the final coding of responses.

History of Diabetes Diagnosis

All participants were asked if they have been told by their doctor that they have diabetes. If female, they were asked if this had only been during pregnancy. Respondents who answered that they had been diagnosed with diabetes other than pregnancy related diabetes, were classified as having chronic diabetes.

Screening for Diabetes

Participants were asked if they have been tested for diabetes. They were then asked when the last time was they were tested for diabetes: within the past twelve months, one to two years ago, more than two years ago, don't know, or refused. We defined our "cases" as those who recalled being tested for diabetes within the past year in order to minimize potential recall problems.

Demographic Characteristics and Health Status

Seven demographic variables were included. These were age, gender, race and ethnicity, education level, annual household income, population density of

county of residence, and body mass index. Because of the small proportion of Oregonians who are not Anglo-Caucasians, respondents were categorized to be either non-Hispanic white, or other. Those in the other category included anyone who said they were Hispanic, Black, Asian/Pacific Islander, American Indian, or Alaska Native. Respondents were classified as living in a Metropolitan county or not depending upon whether or not their county met United States Department of Agriculture criterion of a population density of 1000 inhabitants per square mile. Body mass index was calculated by converting height into meters, weight into kilograms, and dividing weight in kilograms by square of the height in meters.

Diabetes Family History

Participants were asked if they have a parent, related by blood, who has or did have diabetes. They were similarly asked about blood related siblings who have or did have diabetes. All were classified according to whether or not they have a first degree relative with diabetes.

Diabetes Knowledge and Attitudes

Respondents were asked whether they agree or disagree with each of a series of eight factual statements regarding diabetes (asked in random order). The number of correct responses for each participant was tabulated. Those who correctly answered 7 or 8 of the 8 questions were categorized as having good diabetes knowledge. Those who correctly answered 6 or less were categorized as having fair or poor diabetes knowledge. Participants were asked how worried they were that in the next ten years they might get diabetes; very worried, somewhat worried, slightly worried, or not at all worried, and they were

dichotomized into two categories: those with any degree of worry, and those not at all worried. All were asked to identify their perception of the seriousness of diabetes on a scale of 1 to 10, where 1 is not serious and 10 very serious. They were grouped as those who felt diabetes was more serious (rank of 8-10) and those who felt diabetes was less serious (rank of 1-7).

Health Behavior

Participants were queried as to how many days of the last seven they ate breakfast, lunch, and supper. The total number of meals eaten in the past week was calculated, and respondents were categorized into having eaten 0-14 meals, 15-20 meals, or 21 meals. They were also asked how many days of the past seven and on average how many times each day they ate snacks. Respondents were categorized into the number of snacks they ate each week: 0, 1-6, 7-13, or 14 or more.

Tobacco use was assessed by asking "Have you smoked at least 10 cigarettes in your entire life?" and "Do you now smoke cigarettes every day, some days, or not at all?" In this way, participants could be described as being current smokers, former smokers, or never having used tobacco.

Finally, a series of 10 questions was asked to assess the participants' physical activity patterns. They were categorized as either meeting current CDC guidelines (30 minutes of moderate or vigorous activity on five or more days per week) or not.

Statistical Methods and Analysis

To account for the unequal probabilities of selection resulting from the stratified sampling design, mathematical weights were computed for each respondent. The probability of selection was comprised of three components: the probability that the household telephone number was selected from the telephone bank, the probability that a particular adult in the household was selected (1 divided by the number of adults in the household), and the number of residential telephone numbers in the household. The probability of selection for a particular adult was computed as the product of these three components. The weight for each respondent was then computed as the inverse of the probability of selection.

To account for non-coverage resulting from the use of telephones to identify the survey population, post-stratification methods to adjust the mathematical weights were used. The survey respondents were classified into 12 mutually exclusive age and sex categories (18-34 years, 35-44 years, 45-54 years, 55-64 years, and ≥ 65 years; male, female). In each of these categories the respondent weights were summed and then divided by the estimated July 1, 1999 Oregon population estimates²⁸ in the same age and sex strata. The sum of the post-stratified weights was 2,471,003--equivalent to the estimated Oregon adult population. All reported point estimates and associated 95% confidence intervals (95% CI) are computed using the weighted number of respondents.

Statistical analysis of the survey was performed using SUDAAN version 7.5 (Research Triangle Institute, Research Triangle Park, NC). This software is designed to consider weighted data in calculating both point estimates as well as

valid variances of the point estimates in complex survey designs. All reported percentages and odds ratios are based upon the weighted data. The prevalence of diabetes was computed by dividing the number of those who reported having chronic diabetes by the total number of survey respondents. The prevalence of screening for diabetes in the past one year (our case definition) was computed by dividing the number of those who reported being tested in the past year by the number of respondents without diabetes. All characteristics of interest were placed in contingency tables to examine their association with self-reported screening for diabetes within the past year, excluding those already diagnosed with diabetes. Tests of association were performed using Pearson chi-square.²⁹ Variables which met a chi-square significance of p-value less than or equal to 0.20 were further analyzed with logistic regression methods. Univariate logistic regression was performed on these significant variables to determine crude odds ratios. Multivariate logistic regression modeling was used to examine the adjusted associations of demographic characteristics, health behaviors, diabetes family history, and diabetes knowledge and attitudes with self-reported screening. The odds ratio estimated by the likelihood ratio model was used to provide an estimate of the prevalence ratio. If over five percent of responses in a variable were missing, they were included in the analysis as an additional category so as to preserve other information from these respondents.

Results

Prevalence of diabetes

A total sample of 1038 non-institutionalized adult Oregonians (18 years old and older) completed the survey. 54 (5.0%) of our participants stated they were previously diagnosed with diabetes and excluded from analysis. Of the 984 without diagnosed diabetes, the demographic distribution of the participants, including weighted percentages, are shown in Table 2.

Prevalence of screening for diabetes

Of our survey respondents, 34.3% reported never having been tested for diabetes. Twenty-seven point seven percent reported testing in the past one year, 10.6% one to two years ago, and 23.2% more than two years ago. Four point two percent were not able to recall if, or when they had been tested for diabetes.

Summary of association of screening with variables

Seven of fifteen variables met initial significance criteria of chi-square p value less than 0.2. These included age group, body mass index, family history of diabetes, worry about getting diabetes, tobacco use, snacking, and income.

While non-whites reported a screening prevalence of 22.5% compared to 29.3% in whites, this difference was not statistically significant because of the small numbers of nonwhites in our sample.

Several variables had no relationship to screening for diabetes. These included gender, county population density, education level, and physical activity patterns. While breakfast habits were crudely associated with diabetes

screening, lunch, dinner and total meal habits were not. Knowing more about diabetes made little difference in whether or not a participant was screened; of those who correctly answered at least seven of the eight diabetes knowledge questions, 30.6% recalled being screened compared to 27.4% of those who correctly answered less than seven. Also, a participants' perception of diabetes as a serious disease did not make a difference; of those who rated diabetes seriousness eight or above on a ten point scale, 29.9% reported being screened in the past year compared with 26.5% of those who rated diabetes seriousness less than eight.

Logistic Regression Modeling

Variables observed above to be associated with self-reported diabetes screening were analyzed in a multivariate regression model. Meals eaten per week was also included in the multivariate model in order to examine the association of snacking with screening after adjusting for total meals eaten.

We observed significant positive associations of diabetes screening in the past one year with being 65 year or older, having a body mass index of 35 kg/m² or greater, and having a family history of diabetes (Table 5). We observed no association between screening for diabetes in the past one year with tobacco use, worry about getting diabetes in the next ten years, number of meals eaten weekly, number of snacks consumed weekly, or annual household income.

Age was analyzed as a continuous variable and with several different category groupings and always observed to be significantly associated with screening. The odds ratio for being 65 years old or older was 3.21 compared to

those 18-34 years old. Using the ADA risk criteria of age 45 or greater, we observed the odds ratio for screening to be significantly greater for this group at 1.83 (95% confidence interval 1.23, 2.71) compared to those 18-44 years old (data not shown in table 5).

The relationship between screening and body mass index (BMI) was not linear. Those with BMI of 35.0 or greater were significantly more likely to be screened than the referent group with BMI of less than 25.0 kg/m². Those considered mildly obese (BMI 30.0-34.9 kg/m²) were slightly less likely to be screened than those with BMI less than 25.0 kg/m², although this difference was not statistically significant.

Participants who reported having a family history of diabetes were significantly more likely to report screening. After adjusting for other variables, those with a family history had an odds ratio of 1.90 for being screened compared to those without a family history.

Discussion

Using data from a population based telephone survey of adult Oregonians, we observed that self-reported screening in the past one year for diabetes mellitus was significantly associated with being over age 65, having a family history of diabetes, and having a body mass index of 35 kg/m² or over. The relationship between screening and body mass index did not appear linear.

Limitations and Strengths

There clearly are limitations when deriving conclusions from telephone survey data such as this. All of our data are self-reports from participants. It is possible that participants did not correctly recall the occurrence or details of their diabetes screening history, or of any number of the predictor variables. Participants may have forgotten they were screened for diabetes, or in some cases may not have known that their physician checked a blood glucose. Cowie et. al. addressed this issue by comparing data from National Health Information Survey (NHIS) self report of diabetes screening with data from the 1985 National Ambulatory Medical Care Survey (NAMCS) whereby actual reports of screening tests were counted. The NHIS data was extrapolated to predict that 76.3 million diabetes screening tests were performed in the U.S. in 1989 as compared with a predicted 72.9 million from the NAMCS. It was suggested that the similarity of these numbers argues favorably for the validity of diabetes screening self-report.¹² Martin et. al. compared patients' self-report of cholesterol screening in the past five years with data from medical records and found a 92.7% sensitivity and 62.9% specificity for recall.³⁰

It is also possible that differential recall may have biased our findings. Those with a family history of diabetes, or other concerning health risk factors, may be more likely to be screened for diabetes as well as recall having been screened than those without these concerns.

Three issues were not adequately assessed by our survey that could have further informed our understanding of diabetes screening issues: the role of hypertension and hyperlipdemia, the role of being a racial or ethnic minority, and

access to medical care. Participants were not asked whether or not they have been diagnosed with hypertension or hypercholesterolemia. Both are considered screening risk criteria by the ADA, and both were observed by Harwell et. al. to be associated with diabetes screening among adults age 45 or older.¹³

Because of low numbers of minorities in the Oregon general population, our sample included too few to draw conclusions about diabetes screening association with racial and ethnic strata. Edelman et. al. observed a slightly lower prevalence of glycemic testing in non-whites in a large managed care population.¹⁴ Cowie .et. al., using data from the 1989 National Health Interview Survey (NHIS) reported racial/ethnic differences in diabetes screening with 31.2% of whites being screened in the past year, 36.0% of blacks, 27.9% of Mexican Americans, 24.9% of other Hispanics, 16.0% of Asian/Pacific Islanders, and 21.8% of American Indians.¹² Additionally, use of telephones to draw a survey sample meant that those without telephones were not sampled. If those without telephones are substantially different than those with telephones in relation to being screened for diabetes, this could represent a source of bias in our survey results.

Our survey also did not address medical care access issues which could certainly have an effect upon participants' diabetes screening. However, data from the 1999 Oregon Behavioral Risk Factor Surveillance System (BRFSS) revealed that 63.2% of adult Oregonians visited a physician for a routine check-up in the past year. Of those who had such a visit, 35% reported being tested for

diabetes in the past year, whereas only 10.9% of those who hadn't seen a physician in the past year reported being tested for diabetes.³¹

Finally, this is a cross-sectional study. It only assesses the association between characteristics and recall of screening for diabetes. It is not possible to determine issues of causality because we cannot tell whether the characteristic affects being screened for diabetes, or whether having been screened affects the characteristic in question.

Interpretation of Results

Of our weighted random sample, 5.0% reported being diagnosed with diabetes (95% confidence interval 3.45, 6.58), similar to the reported prevalence of 4.7% observed in the 1999 Oregon Behavioral Risk Factor Surveillance Survey, another self-report survey. The overall prevalence of recalled screening in non-diabetic Oregon adults was 27.7% in the past one year and 38.3% in the past two years. Cowie et. al. reported a screening prevalence of 31% in the past year in adults.¹² Harwell et. al. reported a prevalence of screening of 39% in the past one year in older (at least 45 years old) Montana residents.¹³ The Oregon 1999 BRFSS reported a one-year screening prevalence of 26.3% in adults.³¹

Given current published diabetes screening recommendations, it was expected that we would see more screening in the elderly. This relationship seems to hold true, as age was the variable most strongly related to diabetes screening. It is good clinical practice to test the population more likely to have preclinical disease. On the other hand, given that aggressive treatment of diabetes has been shown to slow progression of microvascular complications,

but not macrovascular complications, one could question the effectiveness of this strategy.

One would also expect to find higher prevalence of screening in those with greater body mass index given published recommendations. In our data, this relationship was not consistent. Those with severe obesity (BMI over 34.9 kg/m²) were significantly more likely to report screening with an odds ratio of 2.47 compared to those with BMI less than 25.0 kg/m². This was not true of those considered overweight (BMI 25-29.9 kg/m²) or less severely obese (BMI 30-34.9 kg/m²). Harwell et.al. found that BMI made no difference in screening of their sample of 1112 participants 45 years old or older.¹³ Cowie et.al., with a much larger sample, observed a consistent increasing prevalence of diabetes screening with greater body mass index.¹²

Nor is it unexpected that those with a family history of diabetes would be more frequently screened. Our findings were consistent with both studies cited above.^{12, 13} We noted substantial confounding between family history and the participants' perception of their own susceptibility to diabetes. This raises the question of whether screening results from a physician's noting the family history, or as a direct result of the patient's concern.

Few other behavioral, attitudinal, or demographic factors seem to be associated with diabetes screening. Demographic variables such as gender, education, and living in a rural county were not observed to be associated with screening for diabetes. The two variables associated with the Health Belief Model, perceived susceptibility to getting diabetes, and perceived severity of the

disease, also were not independently associated with screening. Perceived susceptibility is closely associated with family history, and it is impossible to determine how much of the effect on screening is due to family history and how much due to the worry that results from having a family history. Objective knowledge about diabetes was not associated with diabetes screening. Good health habits such as eating regular meals, not snacking, not smoking, and exercising were not found to be associated with diabetes screening.

The three variables observed to be significantly associated with screening are considered to be diabetes risk factors published as screening criteria by the ADA. This supports the hypothesis that the decision to screen for diabetes is generally made in the physician's office depending upon diabetes risk factors.

Conclusions

We analyzed data from a population-based random-digit dialed telephone survey to evaluate the relationship between diabetes screening and several demographic, diabetes risk, knowledge, and attitudinal characteristics. As seen in previous studies, diabetes screening is observed to be associated with greater age, greater body mass index, and family history, all considered risk factors for diabetes. Behavioral characteristics, including diet and activity levels, greater knowledge about diabetes, and concern about getting diabetes, were not associated with screening.

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**Table 1: Items contained in the survey questionnaire relevant to diabetes screening
Oregon General Knowledge Survey, 1999**

Question	Final Coding of Answer
<u>Diabetes Diagnosis</u>	
Have you ever been told by a doctor that you have diabetes? (for females) Was this only during pregnancy?	History of chronic diabetes: yes, no
<u>Diabetes Screening</u>	
Have you ever been tested by your doctor for diabetes? (if yes) When was the last time you were tested?	Diabetes screening: in past one year, one to two years ago, over two years ago, never
<u>Demographic Characteristics and Health Status</u>	
What is your age?	Years: 18-34, 35-44, 45-54, 55-64, 65+
What is your gender? (asked only if unclear)	Male, female
What is your race? Are you of Spanish or Hispanic origin?	White and non-Hispanic, others (see table 2)
What is the highest grade or year of school you completed?	Less than HS degree, HS degree only, 1-3 years of college, 4+ years of college
What is your annual household income from all sources?	<=\$19,999/year, \$20-34,999/year, \$35-74,999/year, >=\$75,000/year
What county do you live in?	Metropolitan county, non-metropolitan county
About how tall are you without shoes? About how much do you weigh without shoes?	Body mass index (kg/m ²): <25.0, 25.0-29.9, 30.0-34.9, >=35.0
<u>Diabetes Family History</u>	
Do you have a parent, related by blood, who has or did have diabetes? Do you have any sisters or brothers, related by blood, who have or did have diabetes?	Family History of Diabetes - Yes, no
<u>Diabetes Knowledge and Attitudes</u>	
Diabetes knowledge – agree or disagree with the following 8 questions: A person can have diabetes and not know it. Diabetes is most common in people age 45 and older. Diabetes can cause a person to get heart disease. Diabetes can cause a person to get kidney disease. Diabetes can cause a person to become blind. Diabetes can cause a person to need lower leg amputations. There is a cure for diabetes. Diabetes can harm a person's body before it is diagnosed.	Number of correct answers: Good knowledge = 7-8 correct Fair or poor knowledge = 0-6 correct
How worried are you that in the next 10 years you will get diabetes? Very worried Somewhat worried Slightly worried Not at all worried	Worried (any expressed degree of worry) Not at all worried
On a scale of 1 to 10, where 10 is very serious and 1 is not serious, how serious is it for someone to have diabetes?	Serious (rank 8-10), not serious (rank 1-7)
<u>Health Behavior</u>	
In the past 7 days, on how many days did you eat breakfast? In the past 7 days, on how many days did you eat lunch? In the past 7 days, on how many days did you eat dinner or supper?	Meals eaten per week – 0-14, 15-20, 21
On how many of the past 7 days did you have snacks? On the days you had snacks, usually how many times a day did you have a snack?	Snacks/week: 0, 1-6, 7-13, >=14
Have you smoked at least 100 cigarettes in your entire life? Do you now smoke cigarettes everyday, some days or not at all?	Current tobacco user Former tobacco user Never used tobacco

Series of 10 questions concerning physical activity habits

Obtains 30 minutes of moderate or vigorous activity on 5 or more days per week: yes, no

Table 2:
Demographic Characteristics of Oregon Adults Without Diagnosed Diabetes
Oregon General Knowledge Survey, 1999

Characteristic	Total Respondents in Category*	Weighted Percentage of Population (%)**
Age group (years)		
	18-34	281
	35-44	203
	45-54	215
	55-64	123
	65+	156
Gender	Male	382
	Female	602
Race	White	891
	Black	15
	Asian/Pacific Islander	20
	American Indian/Alaska Native	21
	Other	30
Hispanic ethnicity	Yes	45
	No	928
Education	No HS degree	77
	HS degree only	288
	1-3 years college	327
	4+ years of college	288
Annual household income	<=\$19,999	179
	\$20,000-34,999	254
	\$35,000-74,999	340
	>=\$75,000	127
County population density	Non-metropolitan	332
	Metropolitan	648
Body mass index (kg/m ²)	<25.0	436
	25.0-29.9	330
	30.0-34.9	126
	>=35.0	67
Tobacco use	Never	472
	Former	280
	Current	232

*may not add up to total of 984 when answers were refused or not known

** weighted count = 2,347,085

**Table 3: Self-Reported Screening for Diabetes Among Adults
Oregon General Knowledge Survey, 1999**

	n	%
Never tested	336	34.3%
Tested in the past one year	273	27.7%
Tested one to two years ago	97	10.6%
Tested over two years ago	241	23.2%
Don't know	37	4.2%

Table 4: Self-reported screening for diabetes in the past 12 months in relation to demographic characteristics, health behaviors, and knowledge and attitudes about diabetes

Oregon General Knowledge Survey, 1999

Characteristic	Total Survey Respondents (n)	Number reporting screening in past year (n)	Percent (%)	Chi-square p-value
Age group* (years)				
18-34	274	60	21.5	0.001
35-44	198	43	21.3	
45-54	208	62	31.6	
55-64	117	44	34.9	
65+	144	63	46.7	
Missing	43			
Gender				
Male	364	92	28.3	0.779
Female	583	181	29.4	
Missing	37			
Race/ethnicity*				
White/non-Hispanic	850	244	29.3	0.248
All others	88	25	22.5	
Missing	46			
Education				
No HS degree	74	17	25.9	0.530
HS degree only	278	85	31.1	
1-3 years college	314	90	25.4	
4+ years of college	277	80	31.5	
Missing	41			
Missing	41			
Annual household income				
<=\$19,999	172	52	35.21	0.116
\$20,000-34,999	240	66	26.8	
\$35,000-74,999	332	89	24.7	
>=\$75,000	126	49	38.0	
Missing	114			
County population density				
Non-metropolitan county	317	96	28.3	0.831
Metropolitan county	627	175	29.1	
Missing	40			
Body mass index* (kg/m ²)				
<25.0	419	104	25.1	0.018
25.0-29.9	321	101	32.0	
30.0-34.9	118	30	20.7	
>=35.0	65	27	49.2	
Missing	61			
Missing	61			
Family history of diabetes*				
Yes	214	88	40.8	0.002
No	714	179	24.8	
Missing	56			
Diabetes knowledge score				
Good	326	104	30.6	0.437
Fair or Poor	612	165	27.4	
Missing	46			
Personal worry about developing diabetes in the next 10 years				
Worried	391	134	32.8	0.088
Not worried	551	136	26.0	
Missing	42			
Perception of diabetes severity				
Serious (score of 8 or above)	623	186	29.9	0.396
Not serious (7 or below)	314	83	26.5	
Missing	47			
Total meals eaten in the past 7 days				
0-14	272	74	26.8	0.496
15-20	356	107	27.6	
21	315	92	32.2	
Missing	41			
Snacks eaten in the past 7 days				

	Zero	108	47	45.2	0.016
	One to six	368	112	30.7	
	Seven to thirteen	237	58	24.9	
	Fourteen and over	226	54	22.4	
	Missing	45			
Tobacco use	Never	454	117	25.4	0.157
	Former	268	93	34.1	
	Current	225	63	30.43	
	Missing	37			
Physical activity - meets CDC guidelines	Yes	354	100	30.5	0.548
	No	583	170	28.1	
	Missing	47			

*indicates variables which are considered screening criteria by ADA

Table 5: Demographic characteristics, health behaviors and diabetes knowledge and attitudes in relation to self-reported screening for diabetes in the past 12 months* Oregon General Knowledge Survey, 1999

Characteristic	Crude Odds Ratio	Adjusted Odds Ratio**	95% Confidence Interval for Adjusted Odds Ratio
Age group (years)			
18-34	1.0	1.0	
35-44	0.99	0.83	(0.46, 1.50)
45-54	1.69	1.28	(0.73, 2.22)
55-64	1.89	1.12	(0.53, 2.35)
65+	3.21	3.21	(1.69, 6.08)
Body mass index* (kg/m ²)			
<25.0	1.0	1.0	
25.0-29.9	1.41	1.21	(0.77, 1.89)
30.0-34.9	0.78	0.82	(0.43, 1.57)
>=35.0	2.90	2.57	(1.23, 5.38)
Family history of diabetes			
Yes	2.08	1.90	(1.19, 3.02)
No	1.0	1.0	
Personal worry about developing diabetes in the next 10 years			
Worried	1.39	1.30	(0.85, 1.97)
Not Worried	1.0	1.0	
Tobacco use			
Current	1.28	1.27	(0.71, 2.27)
Former	1.52	1.35	(0.85, 2.13)
Never	1.0	1.0	
Snacks eaten in the past 7 days			
Zero	1.0	1.0	
One to six	0.54	0.64	(0.34, 1.21)
Seven to thirteen	0.40	0.53	(0.26, 1.07)
Fourteen and over	0.35	0.48	(0.23, 1.02)
Total meals eaten in the past 7 days			
0-14	1.0	1.0	
15-20	1.04	1.22	(0.73, 2.04)
21	1.30	1.09	(0.64, 1.87)
Annual household income			
<=\$19,999	1.0	1.0	
\$20,000-34,999	0.68	0.69	(0.35, 1.34)
\$35,000-74,999	0.60	0.78	(0.41, 1.49)
>=\$75,000	1.13	1.41	(0.67, 2.97)

*907 subjects; weighted count =2,162,472

** The adjusted odds ratio was estimated from a logistic regression model containing terms for all the characteristics shown in this table.

Appendix A

OREGON GENERAL KNOWLEDGE SURVEY

IntroQ

Hello, my name is <Your Name> calling on behalf of Dr. Katrina Hedberg of the Oregon Health Division. We are conducting a study among people from all across Oregon about their health concerns and day-to-day living. We put all the answers together to get an overview. Everyone's answers are confidential.

This telephone number was chosen randomly by the Health Division to be included in the survey.

Is this <repeat phone number >?

1. CORRECT NUMBER (**GO TO PRIVRES**)
2. NO ANSWER
3. NORMAL BUSY
4. ANSWERING MACHINE (**LEAVE MESSAGE USE SCRIPT ONE TIME ONLY**)
5. RETURN SAMPLE RECORD
6. NUMBER IS NOT THE SAME
7. DISCONNECT OR NONWORKING

SHOW ANSWER MACHINE SCRIPT:

Hello, my name is <Name> calling on behalf of Dr. Katrina Hedberg of the Oregon Health Division. We are conducting an important study of health concerns and day-to-day living among people who live in Oregon. I would like to speak with an adult in your household and will be calling back within a couple of days. Thank you in advance for your participation.

PrivRes

Is this a private residence?

1. YES, CONTINUE
2. NO, NON-RESIDENTIAL

NonRes - **Only get this if PrivRes = 2** (Non-Residential)

Thank you very much, but we are only interviewing private residences.

WrongNum - **ONLY GET THIS IF INTROQ = 6** (NUMBER IS NOT THE SAME)

Thank you very much. I seem to have dialed the wrong number. It's possible that your number may be called at a later time.

INTERVIEWER: ON PRESSING ENTER YOU WILL BE RETURNED TO THE INTROQ SCREEN TO HAND DIAL AND VERIFY THE PHONE NUMBER

Adults **EVERYONE GETS**

Our survey requires that we randomly select one adult who lives in your household to be interviewed. How many members of your household, including yourself, are 18 years of age or older?

__ ENTER THE NUMBER OF ADULTS

Men **ONLY GET IF ADULTS>1**

How many of these adults are men?

- 0. None
- 1. One
- 2. Two
- 3. Three
- 4. Four
- 5. Five
- 6. Six
- 7. Seven
- 8. Eight
- 9. Nine

Women **ONLY GET IF ADULTS>1 AND MEN<ADULTS**

How many of these adults are women?

- 0. None
- 1. One
- 2. Two
- 3. Three
- 4. Four
- 5. Five
- 6. Six
- 7. Seven
- 8. Eight
- 9. Nine

WrongTot **ONLY GET IF ADULTS>1 AND MEN+WOMEN<>ADULTS**

Probe: I'm sorry, something is not right.

Number of men -

Number of women - +

Number of Adults -

- 1. Correct the number of men **GO TO MEN**
- 2. Correct the number of women **GO TO WOMEN**
- 3. Correct the number of adults **GO TO ADULTS**

Selected - **ONLY GET THIS IF MORE THAN ONE ADULT IN HOUSEHOLD**

The person in your household I need to speak with is the

_____.
Are you the _____?

1. YES GO TO YOURTHE1
2. NO GO TO GETADULT

OneAdult - ONLY GET THIS QUESTION IF ONLY ONE ADULT IN HOUSEHOLD

Are you the Adult?

1. YES
2. NO

GetAdult - ONLY GET THIS IF ONEADULT = 2 (NO) OR SELECTED = 2 (NO)

May I speak with him or her?

1. YES, ADULT COMING TO THE PHONE
2. NO, GO TO THE NEXT SCREEN, PRESS CTRL END AND SCHEDULE A CALL-BACK

*** DO NOT USE CTRL-END ON THIS SCREEN ***

Yourthe1 - ONLY IF ONEADULT = 1 (YES) OR IF SELECTED = 1 (YES) OR GETADULT = 1

Then you are the person I need to speak with. All the information you provide will be kept strictly confidential. Please be as honest as possible in answering the questions.

ONLY IF RESPONDENT ASKS ABOUT THE LENGTH OF THE INTERVIEW:
The survey will take at least 15 minutes, but may take longer based on your answers. I'll read as quickly as I can.

1. PERSON INTERESTED, CONTINUE
2. GO BACK TO ADULTS QUESTION. WARNING: A NEW RESPONDENT MAY BE SELECTED

GetNewAd - ONLY GET THIS IF SELECTED = 2 (NO)

May I speak with the _____?

1. YES, SELECTED RESPONDENT COMING TO THE PHONE
 2. NO, GO TO NEXT SCREEN, THEN PRESS CTRL-END & SCHEDULE A CALL BACK
- *** DO NOT USE CTRL-END ON THIS SCREEN ***
3. GO BACK TO ADULTS QUESTION. WARNING: A NEW RESPONDENT MAY BE SELECTED.

NewAdult - **ONLY GET THIS IF GETNEWAD = 1 OR 2**

Hello, my name is <your name> calling on behalf of Dr. Katrina Hedberg of the Oregon Health Division. We are conducting a study among people from all across Oregon about their health concerns and day-to-day living. We put all the answers together to get an overview. You have been randomly chosen to be included in the study from among the adult members of your household. All the information you provide will be kept strictly confidential. Please be as honest as possible in answering the questions.

1. PERSON INTERESTED, CONTINUE
2. GO BACK TO ADULTS QUESTION. WARNING: A NEW RESPONDENT MAY BE SELECTED

NonQal

INTERVIEWER:
PLEASE ALERT YOUR SUPERVISOR IMMEDIATELY!!!
THE QUOTAS SET FOR THIS STUDY ARE INCORRECT. AFTER NOTIFYING YOUR SUPERVISOR, PRESS CTRL-END TO GO TO THE DISPOSITION SCREEN, AND RETURN THE RECORD.

DEMQ01 **EVERYONE GETS**

How many children live in your household who are age 17 or younger?

1. ONE
2. TWO
3. THREE
4. FOUR
5. FIVE
6. SIX
7. 7 OR MORE
8. NONE
9. REFUSED

DEMQ02 **EVERYONE GETS**

Are you currently: Employed for wages, Self employed, Out of work for more than 1 year, Out of work for less than 1 year, a Homemaker, Student, Retired or Unable to work?

1. Employed for wages
2. Self employed
3. Out of work for more than 1 year
4. Out of work for less than 1 year
5. Homemaker
6. Student
7. Retired
8. Unable to work
9. REFUSED

DEMQ03 **EVERYONE GETS**

About how much do you weigh without shoes?
Round fractions up

___ ENTER WEIGHT IN WHOLE POUNDS

777. DON'T KNOW /NOT SURE
999. REFUSED

DEMQ03V **ONLY GET IF DEMQ03 IS AN OUT OF RANGE RESPONSE (50-80, 350-775)**

INTERVIEWER: YOU INDICATED ___ POUNDS
IS THIS CORRECT?

1. NO, RE-ASK QUESTION **GOTO DEMQ03**
2. YES, CORRECT AS IS

DEMQ04 **EVERYONE GETS**

About how tall are you without shoes?
Round fractions down

___ ENTER HEIGHT IN FEET AND INCHES
(EX. 5 FEET 9 INCHES = 509)

777. DON'T KNOW / NOT SURE
999. REFUSED

DEMQ04V **ONLY GET IF HEIGHT IS AN OUT OF RANGE RESPONSE (6'9" - 8'5",
2'0 - 4'7")**

INTERVIEWER: YOU INDICATED ___ FEET ___ INCHES TALL.
IS THIS CORRECT?

1. RE-ASK QUESTION **GOTO DEMQ04**
2. YES, CORRECT AS IS

DEMQ05 **EVERYONE GETS**

INTERVIEWER: INDICATE SEX OF RESPONDENT

ASK ONLY IF NECESSARY

1. MALE
2. FEMALE

DEMQ06 **EVERYONE GETS**

Have you smoked at least 100 cigarettes in your entire life?

5 packs = 100 cigarettes

1. YES
2. NO **Skip to DEMQ08**
7. DON'T KNOW / NOT SURE **Skip to DEMQ08**
9. REFUSED **Skip to DEMQ08**
-

DEMQ07 **GET ONLY IF DEMQ06 = 1**

Do you now smoke cigarettes everyday, some days or not at all?

1. EVERYDAY
2. SOME DAYS
3. NOT AT ALL

7. DON'T KNOW /NOT SURE
9. REFUSED

DEMQ08 **EVERYONE GETS**

Do you have more than one telephone number in your household?

1. YES
2. NO - **SKIP TO Q26**

9. REFUSED - **SKIP TO Q26**

DEMQ09 - **GET ONLY IF DEMQ08 = 1**

How many residential telephone numbers do you have?

READ ONLY IF NECESSARY:
Exclude dedicated fax and computer lines

Code 1 - 8 (8 = 8 or more)

1. One
2. Two
3. Three
4. Four
5. Five
6. Six
7. Seven
8. Eight
9. REFUSED

DEMQ09V - **ONLY GET IF DEMQ09 > 2**

You stated that you have <DEMQ09> telephone lines in your household. Remember dedicated fax and computer lines and cellular phones are not included. Is <DEMQ09> the correct number of telephone lines?

9. NO, RE-ASK QUESTION **GOTO DEMQ09**
1-1 YES, CORRECT AS IS

Q26 **EVERYONE GETS**

Next, I will ask about the meals you have eaten in the past 7 days.

INTERVIEWER: IF ASKED, THE PAST 7 DAYS MEANS
7 DAYS ENDING WITH YESTERDAY

In the past 7 days, on how many days did you eat breakfast?

___ ENTER NUMBER

- 0. NONE / ZERO
- 7. EVERYDAY
- 77. DON'T KNOW/ NOT SURE
- 99. REFUSED

Q27 EVERYONE GETS

In the past 7 days, on how many days did you eat lunch?

INTERVIEWER: IF ASKED, THE PAST 7 DAYS MEANS
7 DAYS ENDING WITH YESTERDAY

___ ENTER NUMBER

- 0. NONE / ZERO
- 7. EVERYDAY
- 77. DON'T KNOW/ NOT SURE
- 99. REFUSED

Q28 EVERYONE GETS

In the past 7 days, on how many days did you eat dinner or supper?

INTERVIEWER: IF ASKED, THE PAST 7 DAYS MEANS
7 DAYS ENDING WITH YESTERDAY

___ ENTER NUMBER

- 0. NONE / ZERO
- 7. EVERYDAY
- 77. DON'T KNOW/ NOT SURE
- 99. REFUSED

**** If 0, SKIP TO Q31**

Q29 GET ONLY IF Q28 >0 and Q28 <76

In the past 7 days, usually where did you eat dinner? Would you say: At home, In a car, At work, At a restaurant or café, or Some other place.

INTERVIEWER: IF RESPONDENT SAYS A ROOM IN THE HOUSE FOR
EXAMPLE A DINING ROOM, CODE 1. AT HOME.

- 1. At home
- 2. In a car
- 3. At work
- 4. At a restaurant or café
- 5. Some other place
- 6. ATE OUT (PLACE NOT SPECIFIED)
- 7. DON'T KNOW/ NOT SURE
- 9. REFUSED

Q30 GET ONLY IF Q29 = 1 and (ADULTS + (DEMQ01<=7) >1)

When you ate dinner at home in the past 7 days, would you say you Always, Often, Sometimes, or Never ate with at least one other member of your household?

1. Always
2. Often
3. Sometimes
4. Never

7. DON'T KNOW/ NOT SURE
9. REFUSED

Q31 EVERYONE GETS

For the purposes of my next questions, a snack is food you eat which is not part of a regular meal.

On how many of the past 7 days, did you have snacks?

___ ENTER NUMBER

0. NONE / ZERO
7. EVERYDAY
77. DON'T KNOW/ NOT SURE
99. REFUSED

*** IF 0 Skip to INTRO TO Q33INTRO ***

Q32 GET NEXT ONLY IF 7>= Q31 >0, ATE SNACKS

On the days you had snacks, usually how many times a day did you have a snack?

___ ENTER NUMBER

10. 10 OR MORE
77. DON'T KNOW/ NOT SURE
99. REFUSED

Q33INTRO ONLY GET IF 0<Q26<77 OR 0<Q27<77 OR 0<Q28<77, ATE SOME MEALS

Now I would like to know whether the meals you ate in the past 7 days were prepared at home, from a take out place, or from a restaurant. First, let's talk about meals prepared at home.

Meals prepared at home consist of foods made from items or ingredients purchased at retail places like a grocery store, supermarket, or online grocery service.

Q33 GET ONLY IF Q26 >0 AND Q26< 77

You said you ate breakfast on <Q26> of the past 7 days. On how many of these days did you eat breakfast from food prepared at home?

___ ENTER NUMBER

- 0. NONE / ZERO
- 77. DON'T KNOW/ NOT SURE
- 99. REFUSED

Q34 GET ONLY IF Q27 >0 AND Q27<77

You said you ate lunch on < Q27> of the past 7 days. On how many of these days did you eat lunch from food prepared at home?

___ ENTER NUMBER

- 0. NONE / ZERO
- 77. DON'T KNOW/ NOT SURE
- 99. REFUSED

Q35 GET ONLY IF Q28 > 0 AND Q28<77

You said you ate dinner on < Q28> of the past 7 days. On how many of these days did you eat dinner from food prepared at home?

___ ENTER NUMBER

- 0. NONE / ZERO
- 77. DON'T KNOW/ NOT SURE
- 99. REFUSED

Q36INTRO ONLY GET IF AT LEAST ONE OF BREAKFAST, LUNCH OR DINNER WERE NOT EATEN AT HOME

For my next questions I'm going to ask about food you go from a take-out place. By a take-out place, I mean self-service, fast food, drive through, or any other places where you get prepared food that is ready-to-eat or consumed as is.

Q36 GET ONLY IF 7>=Q26>0 and [(Q33 < Q26) or (Q33=77 or 99)]

You said you ate breakfast on <Q26> of the past 7 days. On how many of these days did you eat breakfast from food that you got at a take-out place?

___ ENTER NUMBER

- 0. NONE / ZERO
- 77. DON'T KNOW/ NOT SURE
- 99. REFUSED

Q37 GET ONLY IF 7>=Q27 >0 and [(Q34 < Q27) or (Q33=77 or 99)]

You said you ate lunch on < Q27> of the past 7 days. On how many of these days did you eat lunch from food that you got at a take-out place?

___ ENTER NUMBER

- 0. NONE / ZERO
- 77. DON'T KNOW/ NOT SURE
- 99. REFUSED

Q38 GET ONLY IF 7>= Q28 > 0 and [(Q35 < Q28) or (Q35=77 or 99)]

You said you ate dinner on < Q28> of the past 7 days. On how many of these days did you eat dinner from food that you got at a take-out place?

___ ENTER NUMBER

- 0. NONE / ZERO
- 77. DON'T KNOW/ NOT SURE
- 99. REFUSED

Q39INTRO GET ONLY IF AT HOME + TAKE OUT < NUMBER OF MEALS FOR AT LEAST ONE MEAL

For the purposes of my next questions, restaurants are places where you sit down at a table and are served by a waiter or waitress.

Q39 GET ONLY IF 7>=Q26 >0 and (Q33 +Q36) < Q26

You said you ate breakfast on <Q26> of the past 7 days. On how many of these days did you eat breakfast at a restaurant?

___ ENTER NUMBER

- 0. NONE / ZERO
- 77. DON'T KNOW/ NOT SURE
- 99. REFUSED

Q40 GET ONLY IF 7>=Q27 >0 and (Q34 + Q37) < Q27

You said you ate lunch on <Q27> of the past 7 days. On how many of these days did you eat lunch at a restaurant?

___ ENTER NUMBER

- 0. NONE / ZERO
- 77. DON'T KNOW/ NOT SURE
- 99. REFUSED

Q41 GET ONLY IF 7>= Q28 > 0 and (Q35 + Q38) < Q28

You said you ate dinner on <Q28> of the past 7 days. On how many of these days did you eat dinner at a restaurant?

___ ENTER NUMBER

- 0. NONE / ZERO
- 77. DON'T KNOW/ NOT SURE
- 99. REFUSED

Q42 EVERYONE

Now I would like to get your opinions and thoughts about physical activity.

Have you ever heard of recommendations or guidelines for the amount of physical activity an adult should get each week?

1. YES
2. NO **SKIP TO Q45**

7. DON'T KNOW/ NOT SURE **SKIP TO Q45**
9. REFUSED **SKIP TO Q45**

Q43A ONLY GET IF Q42 =1

What is the recommendation for the number of days per week that you heard?

INTERVIEWER: IF THE RESPONDENT MENTIONS MULTIPLE NUMBERS OF DAYS, ENTER THE SMALLEST.

___ ENTER NUMBER

77. DON'T KNOW/ NOT SURE **SKIP TO Q44A**
 99. REFUSED **SKIP TO Q44A**
-

43B ONLY GET IF Q43A<=7

INTERVIEWER: DID THE RESPONDENT ANSWER WITH AN EXACT NUMBER OF DAYS, OR A RANGE OR MINIMUM ON PREVIOUS QUESTION?

1. EXACT, OR ONLY ONE NUMBER
2. RANGE, OR USED 'AT LEAST', 'MINIMUM', 'MORE THAN' OR SIMILAR PHRASE

7. DON'T KNOW/ NOT SURE

Q44A ONLY GET IF Q42 =1

What is the recommendation for the amount of time per day that you heard?

INTERVIEWER: IF THE RESPONDENT MENTIONS MULTIPLE NUMBERS OF MINUTES, ENTER THE SMALLEST.

___ ENTER MINUTES PER DAY

777. DON'T KNOW/ NOT SURE **SKIP TO Q45**
999. REFUSED **SKIP TO Q45**

HALF AN HOUR	=	30 MINUTES
ONE HOUR	=	60 MINUTES
HOURLY AND A QUARTER	=	75 MINUTES
HOURLY AND A HALF	=	90 MINUTES
HOURLY AND 3 QUARTERS	=	105 MINUTES
TWO HOURS OR MORE	=	120 MINUTES

Q44B ONLY GET IF Q44A <=120

INTERVIEWER: DID THE RESPONDENT ANSWER WITH AN EXACT NUMBER OF MINUTES, OR A RANGE OR MINIMUM ON THE PREVIOUS QUESTION?

1. EXACT, OR ONLY ONE NUMBER
 2. RANGE, OR USED 'AT LEAST', 'MINIMUM', 'MORE THAN' OR SIMILAR PHRASE

 7. DON'T KNOW/ NOT SURE
-

Q45 **EVERYONE GETS**

As a person gets older would you say it is just as important, less important or more important for them to keep physically active as when they were younger?

1. Just as important
2. Less important
3. More important

7. DON'T KNOW/ NOT SURE
9. REFUSED

Q46INTRO **EVERYONE GETS**

Next I have some questions about your usual physical activities. Please answer them as completely as you can.

Q46 **GET ONLY IF DEMQ02<3**

When you are at work, which of the following best describes what you do? Please include all jobs.

Would you say:

1. One: Mostly sitting or standing
2. Two: Mostly walking, or
3. Three: Mostly heavy labor or physically demanding work

7. DON'T KNOW/ NOT SURE
9. REFUSED

Q47 **EVERYONE GETS**

In a usual week, do you walk for at least 10 minutes at a time while at work, for recreation, exercise, to get to and from places, or for any other reason?

1. YES
 2. NO **SKIP TO Q50**

 6. UNABLE TO WALK **SKIP TO Q50**
 7. DON'T KNOW/ NOT SURE **SKIP TO Q50**
 9. REFUSED **SKIP TO Q50**
-

Q48 ONLY GET IF Q47=1

In a usual week, on how many days do you walk for at least 10 minutes at a time?

___ ENTER NUMBER

77. DON'T KNOW/ NOT SURE

99. REFUSED

Q49 ONLY GET IF Q47=1

On days when you walk for at least 10 minutes at a time, how much total time per day do you spend walking?

- ___ ENTER HOURS AND MINUTES PER DAY
(EXAMPLE 020=20 MINUTES PER DAY
120=1 HOUR AND 20 MINUTES PER DAY
100 = 1 HOUR OR 60 MINUTES
115 = HOUR AND A QUARTER OR 75 MINUTES)
700. 7 HOURS OR MORE
777. DON'T KNOW/ NOT SURE
999. REFUSED
-

Q50 EVERYONE GETS

In a usual week, do you do any activities to increase muscle strength or tone, like lifting weights, pull-ups, push-ups or sit-ups?

1. YES
2. NO **Skip to Q52**
7. DON'T KNOW/ NOT SURE **Skip to Q52**
9. REFUSED **Skip to Q52**
-

Q51 ONLY GET IF Q50 =1

In a usual week, on how many days do you do these activities?

- ___ ENTER NUMBER
77. DON'T KNOW/ NOT SURE
99. REFUSED
-

Q52 **EVERYONE GETS**

Next I will be asking you about your moderate and vigorous physical activities, even if you included them in your previous answers. By moderate activity I mean you have some increases in breathing and heart rate. With vigorous activity you have large increases in breathing and heart rate.

<Other than work activities,> **IF EMPLOYED** in a usual week, do you do any moderate activities, for at least 10 minutes at a time, such as brisk walking, bicycling, vacuuming, gardening, or anything else that causes some increase in breathing or heart rate?

- 1. YES
- 2. NO **SKIP TO Q55**

- 7. DON'T KNOW/ NOT SURE **SKIP TO Q55**
- 9. REFUSED **SKIP TO Q55**

Q53 **GET ONLY IF Q52 =1**

In a usual week, on how many days do you do moderate activities?

___ ENTER NUMBER

- 77. DON'T KNOW/ NOT SURE
- 99. REFUSED

Q54 **ONLY GET IF Q52=1**

On days when you do moderate activities for at least 10 minutes at a time, how much total time per day do you spend doing these activities?

___ ENTER HOURS AND MINUTES PER DAY
(EX. 020=20 MINUTES PER DAY
120=1 HOUR AND 20 MINUTES PER DAY
100 = 1 HOUR OR 60 MINUTES
115 = HOUR AND A QUARTER OR 75 MINUTES)

- 700. 7 HOURS OR MORE
 - 777. DON'T KNOW/ NOT SURE
 - 999. REFUSED
-

Q55 EVERYONE GETS

Other than work activities, in a usual week, do you do any vigorous activities for at least 10 minutes at a time, such as running, aerobics, heavy yard work, or anything else that causes large increases in breathing or heart rate?

- 1. YES
 - 2. NO **SKIP TO Q58**

 - 7. DON'T KNOW/ NOT SURE **SKIP TO Q58**
 - 9. REFUSED **SKIP TO Q58**
-

Q56 ONLY GET IF Q55=1

In a usual week, on how many days do you do vigorous activities?

- ___ ENTER NUMBER

 - 77. DON'T KNOW/ NOT SURE
 - 99. REFUSED
-

Q57 ONLY GET IF Q55=1

On days when you do vigorous activities for at least 10 minutes at a time, how much total time per day do you spend doing these activities?

- ___ ENTER HOURS AND MINUTES PER DAY
(EX. 020=20 MINUTES PER DAY
120=1 HOUR AND 20 MINUTES PER DAY
100 = 1 HOUR OR 60 MINUTES
115 = HOUR AND A QUARTER OR 75 MINUTES)

 - 700. 7 HOURS OR MORE
 - 777. DON'T KNOW/ NOT SURE
 - 999. REFUSED
-

Q58 <GET ONLY IF walk or do moderate or vigorous physical activity on 3+ days/week for at least 30 minutes total [(Q48 + Q53 + Q56 >=3) AND (Q49 + Q54 + Q57 >=030)] >

What is the single most important reason you have for being physically active?

DO NOT READ

CODE FIRST RESPONSE ONLY

INTERVIEWER: IF RESPONSE IS WEIGHT OR HEALTH, PROBE WHICH CATEGORY

- 11. DOCTOR'S ORDERS
- 12. FEEL GOOD
- 13. I LIKE TO EXERCISE
- 14. IMPROVE HEALTH
- 15. LOOK GOOD
- 16. LOSE WEIGHT
- 17. MAINTAIN WEIGHT
- 18. REDUCE DISEASE RISK
- 19. STAY HEALTHY OR MAINTAIN HEALTH
- 20. NO SPECIAL REASON
- 21. OTHER SPECIFY
- 22. WORK OR JOB RELATED

- 77. DON'T KNOW/ NOT SURE
- 99. REFUSED

*** ALL RESPONDENTS SKIP TO Q60 ***

Q59 ONLY GET IF DIDN'T GET Q58

What is the single most important reason you are not active on more days of the week?

DO NOT READ

CODE FIRST RESPONSE ONLY

- 11. COST /TOO EXPENSIVE
 - 12. CURRENTLY INJURED (NOT PERMANENT)
 - 13. DISABLED/PHYSICALLY UNABLE
 - 14. DON'T LIKE TO EXERCISE
 - 15. DON'T SEE THE NEED
 - 16. FAMILY MEMBER(S) DISCOURAGES
 - 17. LACK OF CHILDCARE
 - 18. NO MOTIVATION TO BE MORE ACTIVE
 - 19. NO PLACE
 - 20. NO SAFE PLACE
 - 21. TOO BUSY / NO TIME
 - 22. TOO EMBARRASSED
 - 23. OTHER SPECIFY

 - 77. DON'T KNOW/ NOT SURE
 - 99. REFUSED
-

(Q60-66 in Random Order EVERYONE GETS)

Q60 EVERYONE GETS

Now I am going to read a list of health problems and diseases facing Oregonians today. When I read each health problem or disease, please tell me how you would rate its seriousness on a scale of 1 to 10, where 1 means not serious and 10 means very serious. The introduction text should appear on each question from Q60 to Q66 so the scale is available, but subdued and not read after the first question in the random loop.

Please tell me on a scale of 1 to 10, **(this phrase should be subdued and not read, unless needed, after the third question of the random loop)**
How serious is it for someone to have asthma?

___ ENTER NUMBER

- 77. DON'T KNOW/ NOT SURE
- 99. REFUSED

Q61 EVERYONE GETS

Please tell me on a scale of 1 to 10,
How serious is it for someone to have cancer?

___ ENTER NUMBER

- 77. DON'T KNOW/ NOT SURE
- 99. REFUSED

Q62 EVERYONE GETS

Please tell me on a scale of 1 to 10,
How serious is it for someone to have diabetes?

___ ENTER NUMBER

- 77. DON'T KNOW/ NOT SURE
- 99. REFUSED

Q63 EVERYONE GETS

Please tell me on a scale of 1 to 10,
How serious is it for someone to have heart disease?

___ ENTER NUMBER

- 77. DON'T KNOW
- 99. REFUSED

Q64 EVERYONE GETS

Please tell me on a scale of 1 to 10,
How serious is it for someone to have high blood pressure?

___ ENTER NUMBER

- 77. DON'T KNOW/ NOT SURE
- 99. REFUSED

Q65 EVERYONE GETS

Please tell me on a scale of 1 to 10,
How serious is it for someone to have arthritis?

___ ENTER NUMBER

- 77. DON'T KNOW/ NOT SURE
- 99. REFUSED

Q66 EVERYONE GETS

Please tell me on a scale of 1 to 10,
How serious is it for someone to have AIDS or be infected with HIV?

___ ENTER NUMBER

- 77. DON'T KNOW/ NOT SURE
- 99. REFUSED

(Q67-73 in Random Order EVERYONE GETS)

Q67 EVERYONE GETS

Next I am going to read a list of health problems. When I read each one, please tell me if you are Very Worried, Somewhat Worried, Slightly Worried, or Not at All Worried. **This introduction should be available for each question, but only read for first one of the random loop, and subdued thereafter.**

(Read Would you say Very, Somewhat, Slightly, or Not at all worried for first 3 questions of random loop, then as needed thereafter)

How worried are you that in the next 10 years you will get lung cancer?
Would you say...

- 1. Very worried
- 2. Somewhat worried
- 3. Slightly worried or
- 4. Not at all worried

- 6. ALREADY HAVE (RESPONDENT VOLUNTEERS WITH NO PROBE)
- 7. DON'T KNOW/ NOT SURE
- 9. REFUSED

Q68 EVERYONE GETS

How worried are you that in the next 10 years you will get colon cancer?
Would you say...

- 1. Very worried
- 2. Somewhat worried
- 3. Slightly worried or
- 4. Not at all worried

6. ALREADY HAVE (RESPONDENT VOLUNTEERS WITH NO PROBE)
7. DON'T KNOW/ NOT SURE
9. REFUSED

Q69 EVERYONE GETS

How worried are you that in the next 10 years you will get diabetes?
Would you say...

1. Very worried
 2. Somewhat worried
 3. Slightly worried or
 4. Not at all worried
-
6. ALREADY HAVE (RESPONDENT VOLUNTEERS WITH NO PROBE)
 7. DON'T KNOW/ NOT SURE
 9. REFUSED

Q70 EVERYONE GETS

How worried are you that in the next 10 years you will have a heart
attack? Would you say...

1. Very worried
 2. Somewhat worried
 3. Slightly worried or
 4. Not at all worried
-
6. ALREADY HAVE (RESPONDENT VOLUNTEERS WITH NO PROBE)
 7. DON'T KNOW/ NOT SURE
 9. REFUSED

Q71 EVERYONE GETS

How worried are you that in the next 10 years you will have a stroke?
Would you say...

1. Very worried
 2. Somewhat worried
 3. Slightly worried or
 4. Not at all worried
-
6. ALREADY HAVE (RESPONDENT VOLUNTEERS WITH NO PROBE)
 7. DON'T KNOW/ NOT SURE
 9. REFUSED
-

Q72 EVERYONE GETS

How worried are you that in the next 10 years you will get arthritis?
Would you say...

1. Very worried
2. Somewhat worried
3. Slightly worried or
4. Not at all worried

6. ALREADY HAVE (RESPONDENT VOLUNTEERS WITH NO PROBE)
7. DON'T KNOW/ NOT SURE
9. REFUSED

Q73 EVERYONE GETS

How worried are you that in the next 10 years you will need the help of
others for your daily personal care? Would you say...

1. Very worried
2. Somewhat worried
3. Slightly worried or
4. Not at all worried

6. ALREADY HAVE (RESPONDENT VOLUNTEERS WITH NO PROBE)
7. DON'T KNOW/ NOT SURE
9. REFUSED

Q74 EVERYONE GETS

How worried are you that in the next 10 years you will get AIDS or be
infected with HIV? Would you say...

1. Very worried
2. Somewhat worried
3. Slightly worried or
4. Not at all worried

6. ALREADY HAVE (RESPONDENT VOLUNTEERS WITH NO PROBE)
7. DON'T KNOW/ NOT SURE
9. REFUSED

Q75 ASK ONLY IF DEMQ05=1 (MALE)

How worried are you that in the next 10 years you will get prostate
cancer?

1. Very worried
 2. Somewhat worried
 3. Slightly worried or
 4. Not at all worried

 6. ALREADY HAVE (RESPONDENT VOLUNTEERS WITH NO PROBE)
 7. DON'T KNOW/ NOT SURE
 9. REFUSED
-

Q76 ASK ONLY IF DEMQ05=2 FEMALE

How worried are you that in the next 10 years you will get breast cancer?

1. Very worried
2. Somewhat worried
3. Slightly worried or
4. Not at all worried

6. ALREADY HAVE (RESPONDENT VOLUNTEERS WITH NO PROBE)
7. DON'T KNOW/ NOT SURE
9. REFUSED

Q77 EVERYONE GETS

My next question is about how you think of your body size.

Would you describe yourself as Very underweight, Slightly underweight, About the right weight, Slightly overweight, or Very overweight?

1. Very underweight
2. Slightly underweight
3. About the right weight
4. Slightly overweight
5. Very overweight

7. DON'T KNOW/ NOT SURE
9. REFUSED

Q78A DO NOT GET IF MALE AND Q69 = 6. IF FEMALE AND Q69 =6 ALTERNATE WORDING AND CHOICES. <USE RECODED VARIABLE Q78>

My next questions are about diabetes.

Have you ever been told by a doctor that you have diabetes?

1. YES
IF FEMALE, ASK Was this only during pregnancy?
2. YES, FEMALE AND TOLD ONLY DURING PREGNANCY
3. NO

7. DON'T KNOW/ NOT SURE
9. REFUSED

VERIFY FEMALE IF RESPONSE 2 TO QUESTION 78.

ALTERNATE APPEARANCE:

Earlier you mentioned that you had diabetes.
Was this only during pregnancy?

1. Yes, diabetes only during pregnancy
 2. No

 7. DON'T KNOW/ NOT SURE
 9. REFUSED
-

Q79A EVERYONE GETS

Next, I will ask about diabetes in your family members who are related to you by blood. For your female relatives, do not include diabetes only during pregnancy.

Do you have a parent, related by blood, who has or did have diabetes?

1. YES
2. NO **Skip to Q80A**
3. NO, I AM ADOPTED (*R volunteers this info. Automatically code Q80A= 3 and skip to Q81 or Q82 as appropriate*)
7. DON'T KNOW/ NOT SURE **Skip to Q80A**
9. REFUSED **Skip to Q80A**

Q79B Only get if 79A = 1 (yes)

Was this your mother or your father?

1. Father
2. Mother
3. Both Mother and father
7. DON'T KNOW/ NOT SURE
9. REFUSED

Q80A GET ONLY IF Q79A <> 3. IF Q79A=3 CODE ANSWER 3

Do you have any sisters or brothers, related by blood, who have or did have diabetes?

1. YES
2. NO **SKIP TO Q81**
3. NO I AM ADOPTED **SKIP TO Q81**
7. DON'T KNOW/ NOT SURE **SKIP TO Q81**
9. REFUSED **SKIP TO Q81**

Q80B ONLY GET IF Q80A=1

Was this a brother or a sister?

1. Brother (s)
2. Sister (s)
3. Both brother (s) and sister (s)
7. DON'T KNOW/ NOT SURE
9. REFUSED

Q81A ONLY GET IF RESPONDENT DOES NOT HAVE DIABETES Q78<>1 AND DOES NOT LIVE ALONE, ADULTS > 1 OR DEMQ01 <8.

Does anyone in your current household have diabetes?

1. YES
2. NO **SKIP TO 82A**

7. DON'T KNOW/ NOT SURE **SKIP TO 82A**
9. REFUSED **SKIP TO 82A**

Q81B1, B2, B3 **ONLY GET IF Q81A=1**

Who in your current household has diabetes?

(Code first 3 responses)

PROBE: Who else? **<FOR Q81B2, Q81B3>**

11. SPOUSE
12. BROTHER (S)
13. SISTER (S)
14. MOTHER
15. FATHER
16. SON (S)
17. DAUGHTER (S)
18. GRANDMOTHER (S)
19. GRANDFATHER (S)
20. OTHER RELATIVE (AUNT, UNCLE, COUSIN)
21. OTHER UNRELATED PERSON (STEPPARENT, STEPCHILD, STEPSIBLING, FRIEND)

88. NO OTHERS
77. DON'T KNOW / NOT SURE
99. REFUSED

Q82A ASK ONLY IF RESPONDENT HAS DIABETES Q78= 1 AND DOES NOT LIVE ALONE, ADULTS > 1 OR DEMQ01 <8.

Does anyone else in your current household have diabetes?

1. YES
 2. NO **SKIP TO Q83INTRO**

 7. DON'T KNOW/ NOT SURE **SKIP TO Q83INTRO**
 9. REFUSED **SKIP TO Q83INTRO**
-

Q82B1, B2 ONLY GET IF Q82A=1

Who in your current household has diabetes?

(Code first 2 responses)

PROBE: Who else? <FOR Q82B2>

- 11. SPOUSE
- 12. BROTHER (S)
- 13. SISTER (S)
- 14. MOTHER
- 15. FATHER
- 16. SON (S)
- 17. DAUGHTER (S)
- 18. GRANDMOTHER (S)
- 19. GRANDFATHER (S)
- 20. OTHER RELATIVE (AUNT, UNCLE, COUSIN)
- 21. OTHER UNRELATED PERSON (STEPPARENT, STEPCHILD, STEPSIBLING, FRIEND)

- 88. NO OTHERS **SKIP TO Q83INTRO**
- 77. DON'T KNOW / NOT SURE **SKIP TO Q83INTRO**
- 99. REFUSED **SKIP TO Q83INTRO**

Q83INTRO - **THIS SERIES IS RANDOMIZED**

Next, I am going to read a list of statements. After I read each one, please tell me if you agree, disagree, or don't know. Here is the first statement.

AFTER THE THIRD QUESTION IN THIS SERIES, "WOULD YOU AGREE OR DISAGREE" SHOULD BE IN GRAY AND ONLY READ IF NEEDED.

(Q83 - Q90 IN RANDOM ORDER)

Q83 **EVERYONE GETS**

A person can have diabetes and not know it. Would you agree or disagree?

AGREE (*Interviewer probe: Would you say Strongly or somewhat agree?*)

- 1. Strongly Agree
- 2. Somewhat Agree

DISAGREE (*Interviewer probe: Would you say Strongly or somewhat disagree?*)

- 3. Strongly Disagree
 - 4. Somewhat Disagree
 - 5. NO OPINION
 - 7. DON'T KNOW/ NOT SURE
 - 9. REFUSED
-

Q84 **EVERYONE GETS**

Diabetes is most common in people age 45 and older. Would you agree or disagree?

AGREE (*Interviewer probe: Would you say Strongly or somewhat agree?*)

1. Strongly Agree
2. Somewhat Agree

DISAGREE (*Interviewer probe: Would you say Strongly or somewhat disagree?*)

3. Strongly Disagree
 4. Somewhat Disagree
 5. NO OPINION
 7. DON'T KNOW/ NOT SURE
 9. REFUSED
-

Q85 **EVERYONE GETS**

Diabetes can cause a person to get heart disease. Would you agree or disagree?

AGREE (*Interviewer probe: Would you say Strongly or somewhat agree?*)

1. Strongly Agree
2. Somewhat Agree

DISAGREE (*Interviewer probe: Would you say Strongly or somewhat disagree?*)

3. Strongly Disagree
 4. Somewhat Disagree
 5. NO OPINION
 7. DON'T KNOW/ NOT SURE
 9. REFUSED
-

Q86 **EVERYONE GETS**

Diabetes can cause a person to get kidney disease. Would you agree or disagree?

AGREE (*Interviewer probe: Would you say Strongly or somewhat agree?*)

1. Strongly Agree
2. Somewhat Agree

DISAGREE (*Interviewer probe: Would you say Strongly or somewhat disagree?*)

3. Strongly Disagree
 4. Somewhat Disagree
 5. NO OPINION
 7. DON'T KNOW/ NOT SURE
 9. REFUSED
-

Q87 **EVERYONE GETS**

Diabetes can cause a person to become blind. Would you agree or disagree?

AGREE (*Interviewer probe: Would you say Strongly or somewhat agree?*)

1. Strongly Agree
2. Somewhat Agree

DISAGREE (*Interviewer probe: Would you say Strongly or somewhat disagree?*)

3. Strongly Disagree
 4. Somewhat Disagree
 5. NO OPINION
 7. DON'T KNOW/ NOT SURE
 9. REFUSED
-

Q88 **EVERYONE GETS**

Diabetes can cause a person to need lower leg amputations. Would you agree or disagree?

AGREE (*Interviewer probe: Would you say Strongly or somewhat agree?*)

1. Strongly Agree
2. Somewhat Agree

DISAGREE (*Interviewer probe: Would you say Strongly or somewhat disagree?*)

3. Strongly Disagree
 4. Somewhat Disagree
 5. NO OPINION
 7. DON'T KNOW/ NOT SURE
 9. REFUSED
-

Q89 **EVERYONE GETS**

There is a cure for diabetes. Would you agree or disagree?

AGREE (*Interviewer probe: Would you say Strongly or somewhat agree?*)

1. Strongly Agree
2. Somewhat Agree

DISAGREE (*Interviewer probe: Would you say Strongly or somewhat disagree?*)

3. Strongly Disagree
 4. Somewhat Disagree
 5. NO OPINION
 7. DON'T KNOW/ NOT SURE
 9. REFUSED
-

Q90 **EVERYONE GETS**

Diabetes can harm a person's body before it is diagnosed. Would you agree or disagree?

AGREE (*Interviewer probe: Would you say Strongly or somewhat agree?*)

1. Strongly Agree
2. Somewhat Agree

DISAGREE (*Interviewer probe: Would you say Strongly or somewhat disagree?*)

3. Strongly Disagree
4. Somewhat Disagree
5. NO OPINION
7. DON'T KNOW/ NOT SURE
9. REFUSED

Q91 **ONLY GET IF RESPONDENT DOES NOT HAVE DIABETES, Q78<>1**

To your knowledge, have you been tested for diabetes?

1. YES
2. NO **SKIP TO Q93**
7. DON'T KNOW/ NOT SURE **SKIP TO Q93**
9. REFUSED **SKIP TO Q93**

Q92 **ONLY GET IF Q91=1**

When was the last time you were tested for diabetes?

INTERVIEWER: READ ONLY IF NEEDED

1. Within the past 12 months (0-12 months ago)
 2. Within the past 2 years (1 to 2 years ago)
 3. More than 2 years ago
 7. DON'T KNOW/ NOT SURE
 9. REFUSED
-

Q93 ASK Q93-Q98 questions ONLY IF positive family history (Q79A =1 or Q80A =1) or current HH member has diabetes (Q81A=1) or Respondent has diabetes (Q78=1)

THIS SERIES OF QUESTIONS WILL BE ASKED IN RANDOM ORDER Q93 - Q98.

My next questions are about some things a person with diabetes can do to help control it. Please tell me how you would rate the importance of each on a scale of 1 to 10 where 1 means least important and 10 means most important.

The introduction text should appear on each question from Q93 to Q98 so the scale is available, but subdued and not read after the first question in the random loop.

Please tell me on a scale of 1 to 10, (this phrase should be subdued and not read, unless needed, after the third question of the random loop)

Please tell me on a scale of 1 to 10 how important is it for a person with diabetes to get a health check-up every year?

___ ENTER NUMBER

77. DON'T KNOW/ NOT SURE

99. REFUSED

Q94 EVERYONE GETS

Please tell me on a scale of 1 to 10 how important is it for a person with diabetes to maintain a healthy weight?

___ ENTER NUMBER

77. DON'T KNOW/ NOT SURE

99. REFUSED

Q95 EVERYONE GETS

Please tell me on a scale of 1 to 10 how important is it for a person with diabetes to stop smoking if they smoke?

___ ENTER NUMBER

77. DON'T KNOW/ NOT SURE

99. REFUSED

Q96 EVERYONE GETS

How important is it for a person with diabetes to check their blood glucose every day?

___ ENTER NUMBER

77. DON'T KNOW/ NOT SURE

99. REFUSED

Q97 EVERYONE GETS

How important is it for a person with diabetes to check their feet for sores or irritations every day?

___ ENTER NUMBER

77. DON'T KNOW/ NOT SURE

99. REFUSED

Q98 EVERYONE GETS

How important is it for a person with diabetes to write down or save their blood glucose test results each day?

___ ENTER NUMBER

77. DON'T KNOW/ NOT SURE

99. REFUSED

DEMQ10 EVERYONE GETS

Finally I have just a few more questions.

What is the highest grade or year of school you completed?

READ ONLY IF NECESSARY

1. Never attended school or only attended kindergarten
 2. Grades 1 through 8 (Elementary)
 3. Grades 9 through 11 (Some high school)
 4. Grade 12 or GED (High school graduate)
 5. College 1 year to 3 years (Some college / technical school)
 6. College 4 years or more (College graduate)

 9. REFUSED
-

DEMQ11.1 - DEMQ11.7 **EVERYONE GETS**

Is your annual household income from all sources:

- Less than \$25,000
- Less than \$20,000
- Less than \$15,000
- Less than \$10,000
- Less than \$35,000
- Less than \$50,000
- Less than \$75,000

- 1. Yes
- 2. No
- 7. DON'T KNOW / NOT SURE **SKIP TO DEMQ12**
- 9. REFUSED **SKIP TO DEMQ12**

INCOME From the responses in DEMQ11:

- 1. Less than \$10,000
- 2. \$10,000 to less than \$15,000
- 3. \$15,000 to less than \$20,000
- 4. \$20,000 to less than \$25,000
- 5. \$25,000 to less than \$35,000
- 6. \$35,000 to less than \$50,000
- 7. \$50,000 to \$75,000
- 8. \$75,000 or more

- 77. DON'T KNOW/NOT SURE
- 99. REFUSED

DEMQ12 **EVERYONE GETS**

What is your age?

___ ENTER AGE IN YEARS

- 7. DON'T KNOW/ NOT SURE
 - 9. REFUSED
 - 99. 99 OR OLDER
-

DEMQ13 **EVERYONE GETS**

What is your race?

Would you say:

Interviewer: If the respondent replies Hispanic probe: Are you white Hispanic, black Hispanic, Asian or Pacific Islander and Hispanic, American Indian or Alaska Native and Hispanic, or other race and Hispanic?

Only code other race and Hispanic as #5 after probing

1. White
2. Black
3. Asian, pacific Islander
4. American Indian, Alaska native
5. Other (Specify)

7. DON'T KNOW / NOT SURE
9. REFUSED

DEMQ14 **EVERYONE GETS**

Are you of Spanish or Hispanic origin?

Interviewer: If the respondent replied Hispanic to the previous question, code this question yes and continue.

1. YES
 2. NO

 7. DON'T KNOW / NOT SURE
 8. REFUSED
-

DEMQ15 **EVERYONE GETS**

What county do you live in?

Enter the county name: _____

D = DON'T KNOW/ NOT SURE

R = REFUSED

CLOSING EVERYONE GETS

That was my last question. All your answers will be kept strictly confidential. Thank you very much for your time and your valuable help.

INTERVIEWER: HANG UP AND PRESS '1' TO CONTINUE
TO NEXT SCREEN AND ENTER COUNTY CODE

ABSOLUTELY DO NOT UNDER ANY CIRCUMSTANCES USE <CTRL><END>

CNTYCODE EVERYONE GETS

COUNTY NAME ENTERED WAS <DEMQ15>.

___ Enter County Code

777. DON'T KNOW/ NOT SURE

999. REFUSED
