

Hypertension Surveillance in Canada

Minimum Standards for Assessing Blood Pressure in Surveys

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ABSTRACT

The last Canadian survey that accurately assessed hypertension treatment and control is over 12 years old. The survey indicated that only 13% of adults with hypertension were treated and controlled. Statistics Canada has announced a new survey that will measure health risks in 2007-2008. A committee of hypertension and survey experts was formed to provide recommendations to ensure the survey would address the minimum surveillance needs of the hypertension community. The committee made several innovative recommendations to improve the reproducibility and standardization of blood pressure assessment. In particular, it was recommended to adopt oscillometric measurement and to have measurements conducted in the absence of study personnel. Continued use of standard Canadian survey questions to assess awareness and treatment of hypertension was recommended to allow comparison with prior surveys. It was also recommended that Canada adopt a specific question on lifestyle changes. The new survey will allow the Canadian hypertension community, and in particular the Canadian Hypertension Education Program, to evaluate the effectiveness of current programs for prevention, treatment and control of hypertension and to revise our strategies based on the results.

MeSH terms: Hypertension; blood pressure; population surveillance; public health; surveys; blood pressure determination; sphygmomanometers

La traduction du résumé se trouve à la fin de l'article.

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High blood pressure is estimated to be the leading risk factor for death in women and the second leading risk factor in men in many industrialized countries, including Canada.¹ However, the latest reliable national data on hypertension prevalence, awareness, treatment and control come from a survey conducted between 1985 and 1992.² When the Canadian survey data were compared to similar data from the United States (US), hypertension prevalence was similar between the two countries (20.1% vs. 21.1% of Canadian and American adults, respectively) but awareness of diagnosis (69% vs. 57%), treatment of hypertension (52% vs. 34%) and treatment and control rates (25% vs. 13%) were substantially higher in the US than in Canada.² More recent data from the US show a further improvement in treatment and control rates.³ The Canadian Hypertension Education Program (CHEP) was initiated in 1999 to improve treatment and control of hypertension in Canada.^{4,5}

Statistics Canada plans to survey major health risks of Canadians starting in 2007. A committee was established by the Canadian Hypertension Society, the Canadian Coalition for High Blood Pressure Prevention and Control, and the Heart and Stroke Foundation of Canada with the purpose of 1) establishing the minimum and desirable criteria, and 2) devising the methodology for assessing blood pressure in Canadian surveys. Published standardized blood pressure survey methodology will enable the planning of future studies within Canada, and perhaps internationally, the results of which can be compared. This commentary provides a brief overview of the full committee report⁶ found at www.hypertension.ca, and represents a step in the process toward developing accepted standards for assessing blood pressure in surveys.

The recommendations were developed in the setting of evolving technology and foreseeable bans on mercury-containing devices in the measurement of blood pressure. Furthermore, recommendations were devised to allow reliable analysis of time trends in hypertension prevalence, awareness, treatment and control rates. The Committee consisted of 19 Canadian experts in measurement of blood pressure, epidemiology of hypertension and hyper-

tension surveys.* The Committee reviewed a Health Canada report on the epidemiology of hypertension in Canada that examined methods used in previous Canadian as well as other countries' national surveys, and considered the annually updated evidence-based recommendations on assessment and follow-up of blood pressure from the CHEP.

Canada has an excellent system of administering regular questionnaire surveys on health risk factors such as hypertension and disease. The National Population Health Survey (NPHS) and Canadian Community Health Survey (CCHS) are but two examples. However, blood pressure measurement is not a feature of these surveys. A large proportion (approximately 40%) of hypertensive Canadians are unaware of their condition.⁷ Therefore, questionnaire surveys alone will markedly underestimate the extent of hypertension in Canada. For example, increased awareness will result in a higher apparent incidence and prevalence estimate of hypertension. Additionally, questionnaire surveys cannot assess the treatment and control rate for hypertension, a critical parameter for gauging the use and success of interventions known to decrease morbidity and mortality associated with hypertension.

Measurement of blood pressure in surveys is not a trivial undertaking. Small systematic differences in the assessment of blood pressure will have marked effects on the estimated prevalence, incidence and control of hypertension. For example, if survey methodology introduced a systematic 5 mm Hg increase in diastolic blood pressure, the number of hypertensive patients identified would roughly double.⁸ Increasing the number of readings or occasions at which it is measured leads to lower estimates of blood pressure and lower prevalence of hypertension.⁹ Thus, precise methodology for assessing blood pressure in surveys is crucial in order to obtain accurate and reproducible readings.

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TABLE I

Main Recommendations (Abridged) for Minimum Standards for Surveys Measuring Blood Pressure

| | |
|---|---|
| Questions* | <ul style="list-style-type: none"> To assess awareness of a hypertension diagnosis To assess use of medication to lower blood pressure To assess lifestyle advice to lower blood pressure by a health care professional All questions should be answered by all participants |
| Measurement of blood pressure to determine the hypertension prevalence and control rate | <ul style="list-style-type: none"> Use validated oscillometric devices† Measures should be triggered by the patient or automated in the absence of survey personnel or other observers Use a patient preparation, cuff selection and measurement technique modified from the CHEP recommendations for use with automated blood pressure measurement devices‡ 3 or more readings per visits 2 or more visits |
| Data analysis | <ul style="list-style-type: none"> The data should be analyzed as a group and by age and gender to determine: the prevalence of hypertension according to Canadian and international definitions; and the percent of hypertensive persons aware of being hypertensive, treated for hypertension, and controlled to recommended clinical targets using Canadian standards Data from prior surveys should be reanalyzed with population, age and gender adjustments to determine time and geographical trends All major national and regional survey results should be stored in a central database and made available for independent analysis. |

* See Table II for the specific questions recommended

† Acceptable standards include the British Hypertension Society Protocol,¹⁰ the International Protocol¹¹ and the Association for the Advancement of Medical Instrumentation Protocol¹²

‡ The specific recommendations can be found at www.hypertension.ca in the resource section 'National BP survey. (2004) A report of an expert committee: Minimum standards for assessing blood pressure in surveys.'

The key Committee recommendations are presented in Table I.

Any health survey that includes blood pressure measurement and a questionnaire should determine the prevalence, awareness, drug treatment, and control of hypertension. The inclusion of a question on 'lifestyle' specific to hypertension was viewed as highly desirable. As seemingly minor wording changes can affect how questions are answered, the Committee recommended using existing questions from the Canadian Community Health Survey (CCHS) to assess awareness and treatment of hypertension, to facilitate comparison with past Canadian surveys (Table II). It is noteworthy that in the United States, the question for assessing hypertension awareness is worded differently than in Canada, which could affect interpretation of awareness rates between the two countries. Prevalence and control will be determined by measurement of blood pressure.

Oscillometric determination of blood pressure is recommended instead of auscultation. Accurate oscillometric devices are available and require less training to operate. Evidence suggests that, despite training, the use of recommended auscultatory technique can decrease over time.

In order to be recommended for use in a survey, any blood pressure measuring device must have passed the clinical evalua-

tion protocol of the British Hypertension Society (BHS),¹⁰ the International Protocol¹¹ or the Association for the Advancement of Medical Instrumentation (AAMI).¹² The primary factors differentiating the devices were cost, automation, ease of cuff application and cuff shape, power supply, equipment reliability, memory and programmability. Prior to selection of a device, a systematic review of available devices needs to be conducted and only a single device and method should be selected in any given survey.

The Committee recommended that blood pressure readings be taken in the absence of survey personnel in order to avoid observer-subject interactions that could influence blood pressure. Patient preparation and technique recommendations were similar to those of the Canadian Hypertension Education Program, but were modified for fully automated blood pressure devices.¹³ The Committee also recommended that the measurement of blood pressure be taken on more than one occasion, and that there be a minimum of 3 readings per occasion.

The report contains several recommendations for innovation that are likely to create both discussion and more reliable information on blood pressure. For example, the recommendations to adopt oscillometric measurement and to have measure-

TABLE II

Questions on Hypertension Awareness and Treatment in the Canadian Community Health Survey

Remember, we're interested in conditions diagnosed by a health care professional.

Do you have high blood pressure?

- 1) Yes
- 2) No
- 3) Don't know

Now I'd like to ask a few questions about your use of prescription medications.

In the past month, that is, from [date one month] to yesterday, did you take medicine for blood pressure?

- 1) Yes
- 2) No
- 3) Don't know

ments conducted in the absence of study personnel will improve the reproducibility and standardization of readings. By using automated blood pressure measuring devices, interactions between survey respondents and the person measuring blood pressure can be minimized. Furthermore, well-documented problems of auscultation, including changes in measurement technique over time and terminal digit bias, will be avoided. The recommendation to assess lifestyle treatment of hypertension will allow tracking of a key treatment message from CHEP. Lifestyle modification is a part of the fundamental approach to the management of hypertension, but is not evaluated in current national surveys. The ability to track the success or failure of this critical but difficult-to-implement message will allow adjustments in the CHEP program.

The new survey recommendations call for all respondents to answer all survey questions. From past surveys, it is known that about 5% of respondents deny hypertension although they acknowledge that they are being treated for high blood pressure. Possibly, these people believe they do not have hypertension either because of their treatment or the treatment's success in lowering their blood pressure. This latter issue will be resolved by having all respondents answer whether or not they have taken blood pressure medication or lifestyle modification to treat hypertension.

Data need to be analyzed according to current Canadian criteria for blood pressure control, stratified by age groups and adjusted for age and gender to compare the overall rates with previous surveys. After each survey, it is recommended that prior survey results be reanalyzed to the same standards to allow determination of time-related changes in hypertension prevalence,

awareness, treatment and control. A central repository of all national survey data is recommended to facilitate analysis of the data over time, regular physical measures surveys of blood pressure are required to track prevalence of hypertension and the treatment and control rate. As is done with the NHANES survey data in the US, researchers should be provided with easy access. Having standardized, accessible and current survey data will facilitate comparisons among countries to enable physicians, scientists and policy-makers to close gaps in understanding and increase the potential for improvement.^{14,15}

The Canadian hypertension community has played a leadership role in analyzing and disseminating the results of the 1985-1992 blood pressure survey, and in implementing an extensive program to improve awareness, treatment and control of hypertension based on the survey results. The next major step forward depends on the inclusion of blood pressure measurement and related questions in the Statistics Canada survey in 2007. Once the 2007-2008 survey results are available, the hypertension community will have to re-examine its strategies to prevent hypertension and to improve awareness, treatment and control.

It is hoped that this commentary will make those interested in surveillance and hypertension aware of the recommendations, and stimulate discussion on the need to standardize key aspects of health surveys and, in particular, assessment of blood pressure and hypertension. This report was developed by a large group of Canadian experts. However, internationally accepted standards would have greater value and would improve the ability to compare and learn from different national and regional programs to prevent and control hyper-

tension. Efforts by the World Health Organization to standardize survey methods for measurement of blood pressure need to be furthered.¹⁶ Regular standardized surveys that measure blood pressure (and other health risks) are essential to a credible effort to prevent disease and improve health.

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RÉSUMÉ

La dernière enquête à avoir évalué de façon précise le traitement et le contrôle de l'hypertension au Canada date de 12 ans. Cette enquête a révélé que seulement 13 % des adultes hypertendus étaient à la fois traités et contrôlés. Statistique Canada a annoncé une nouvelle enquête mesurant les facteurs de risques pour la santé en 2007-2008. On a constitué un comité de spécialistes de l'hypertension et des enquêtes de santé, que l'on a chargé de formuler des recommandations pour que l'enquête comporte un minimum de données critiques de surveillance pour la communauté médicale qui s'intéresse à l'hypertension. Le comité a fait plusieurs recommandations novatrices en vue d'améliorer la reproductibilité et la standardisation de la prise de pression artérielle. L'une de ces recommandations est d'adopter les mesures oscillométriques de la pression artérielle et de prendre ces mesures en l'absence des chercheurs associés à l'étude. L'utilisation de questions types tirées d'enquêtes précédentes est recommandée afin de permettre la comparaison avec les données antérieures. Il est également recommandé que le Canada adopte des questions spécifiques sur le changement des modes de vie. La nouvelle enquête permettra à la communauté intéressée par l'hypertension, tout particulièrement au Programme canadien d'éducation sur l'hypertension, d'évaluer l'efficacité des programmes actuels de prévention, de traitement et de contrôle de l'hypertension, et de revoir nos stratégies à la lumière des résultats.

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