Availability of data for monitoring noncommunicable disease risk factors in India

Magdalena Z Raban,[a] Rakhi Dandona[a] & Lalit Dandona[a]

Objective To examine the availability of data measuring noncommunicable disease (NCD) risk factor indicators from household surveys conducted in India from 2000 to 2009.

Methods Questionnaires and publications used in household surveys were identified through internet and PubMed searches and examined to determine which core NCD risk factor indicators recommended by the World Health Organization (WHO) for NCD monitoring were being measured. Surveys with a sample size of 5000 or more were included to ensure a certain level of precision. The completeness of core indicator measurement and the geographical representativeness of the surveys were assessed.

Findings Twenty six surveys met the inclusion criteria. Among the WHO-recommended core behavioural risk factor indicators, those monitoring tobacco use were measured completely in national and subnational surveys; those assessing dietary intake and physical inactivity were measured only in subnational surveys, and those assessing alcohol use were not measured at all. Among WHO-recommended core biological risk factors, only body mass index was measured in national and subnational surveys, whereas blood pressure, fasting blood glucose and blood cholesterol were measured only in subnational surveys. Due to the use of non-standard indicator definitions, measurement of core indicators in some of the national and subnational surveys was incomplete.

Conclusion The availability of data on core risk factor indicators to monitor the increasing burden of NCDs is inadequate in India. These indicators using standardized definitions should be included in the periodic national household health surveys to provide data at the national and disaggregated levels.

Abstracts in عربي, 中文, Français, Русский and Español at the end of each article.

Introduction

Noncommunicable diseases (NCDs) were estimated to account for over 50% of the deaths and 43% of the disability-adjusted life years (DALYs) lost in India in 2004[1] and they are prevalent across all socioeconomic strata in the country.[2,3] According to predictions, by 2030 NCDs will account for almost three quarters of all deaths in India[2] and the years of life lost due to coronary heart disease will be greater in that country than in China, the Russian Federation and the United States of America combined.[2] To address the growing burden of NCDs, the government of India has launched several programmes that aim to reduce the prevalence of modifiable NCD risk factors.[4,5] These risk factors, which include tobacco use, alcohol use, low fruit and vegetable intake, physical inactivity, overweight and obesity, high blood pressure, high blood glucose and high blood cholesterol, account for an estimated 61% of cardiovascular disease deaths in low- and middle-income countries.[6] Information on the prevalence of NCD risk factors in the population is crucial for NCD programme monitoring and planning, and can assist in predicting the future burden of disease. Ideally, this information should be collected periodically as part of NCD surveillance to allow comparisons over time both nationally and at appropriate levels of disaggregation.

The STEPwise approach to surveillance (STEPS) of the World Health Organization (WHO), based on conducting population surveys to collect information on the major modifiable NCD risk factors, has been used in many studies globally[7] and was designed for use in low- and middle-income countries.[8,9] In 2009, WHO proposed a set of core indicators derived from STEPS for monitoring NCD risk factors nationally and globally. These core indicators were deemed practical and easily obtainable by countries at all levels of technical capacity (Box 1).[10,11]

In the light of the rising burden of NCDs and of government efforts to control NCDs in India, NCD risk factor surveillance should be a priority for the national health information system. To assess the current status of NCD risk factor information in India, we studied the availability of data measuring the WHO core indicators and the STEPS indicators from household surveys conducted in India over the 10-year period from 2000 to 2009.

Methods

Survey selection criteria

Household surveys that collected information on at least one risk factor in the general adult population included in the WHO-recommended core indicators and STEPS indicators (tobacco use, alcohol use, physical inactivity, diet, body mass index [BMI], waist and/or hip circumference, blood pressure, fasting blood glucose, blood cholesterol),[8] with data collection completed in or after the year 2000 and with a minimum sample size of 5000 individuals, were included. This sample size would allow measurement of a risk factor with a prevalence of 15% and a 2% absolute margin of error in males and females at the 95% confidence level, taking into account survey design effect and response rate.[8]

Identification of household surveys

A previous study on the health information system in India identified household surveys that form part of the country's routine health information system.[12] The web sites of the organizations conducting these surveys were searched for ad-

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Box 1. **Core behavioural and biological noncommunicable disease (NCD) risk factor indicators recommended by WHO for NCD monitoring[10]**

Behavioural risk factors

Tobacco use

- Prevalence of tobacco use – use reported in three status categories: non-user, occasional user, daily user.
- Prevalence of cigarette smoking – smoking reported in three status categories: non-smoker, occasional smoker, daily smoker.

Alcohol use

- Prevalence of alcohol consumption – consumption reported in four status categories: lifetime abstainer, past-12-month abstainer, drank in last 12 months but not current user, and current user (defined as having drunk an alcoholic beverage in the past 30 days).
- Prevalence of heavy episodic drinking (past week and past month) – episodic drinking defined as consumption of ≥ 5 drinks on a single occasion for men and of ≥ 4 drinks for women.

Diet

- Prevalence of low fruit and vegetable consumption – consumption defined as number of daily servings of fruits and vegetables and reported in four groupings: 0; 1–2; 3–4; ≥ 5.

Physical inactivity

- Total physical activity in adults reported in three categories: low level (insufficiently active) (< 600 MET[a]-minutes per week); moderate level (minimally active) (≥ 600 but < 3000 MET-minutes per week); high level (sufficiently active) (≥ 3000 MET-minutes per week).

Biological risk factors

- Body mass index[b] (height and weight measurements)
- Blood pressure
- Fasting blood glucose
- Blood cholesterol

[a] Metabolic equivalent of task, a unit used to express the intensity of physical activity.
[b] Weight in kilograms divided by height in metres squared (kg/m^2).

Box 2. **PubMed search strategy**

The following keywords were searched in combination with "India" and "epidemiology OR prevalence OR distribution" for articles published in the year 2000 or onwards:

"tobacco", "alcohol intake", "fruit intake", "vegetable intake", "physical activity", "exercise", "sedentary lifestyle", "BMI", "overweight", "obesity", "waist circumference", "waist hip ratio", "blood pressure", "hypertension", "metabolic syndrome", "diabetes", "blood sugar", "hyperglycaemia", "dysglycaemia", "glucose abnormalities", "cholesterol", "lipids", "coronary heart disease", "myocardial infarction", "angina", "heart", "coronary", "cardiovascular", "ischaemic heart disease", "stroke"; excluding publication type "review".

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ditional, more recent household surveys. The WHO Global NCD Infobase database was also searched.[13] These initial searches were followed by a PubMed search conducted in October 2010. The search strategy is shown in Box 2.

Titles of the citations returned in the search were assessed and those clearly not relevant were excluded. Abstracts of the remaining citations were reviewed, and full papers were reviewed to identify those that potentially fulfilled the inclusion criteria. Multiple publications arising from a particular survey were treated as a single survey. References cited in the full papers were hand searched for other potentially relevant surveys.

Documentation from surveys

For each identified survey we recorded the year(s) it was conducted, the states covered, sample size, age and sex included and rural/urban location. Surveys were ranked in decreasing order of coverage and in terms of geographic representativeness as follows: national, representative of states or regions: the sample covered the majority of the country and was designed to be disaggregated to the state or regional level; national, nationally representative only: the sample covered the majority of the country and was not designed to be disaggregated to the state or regional levels; multiple-state, representative:

the sample was representative of the populations of more than one state; multiple-state, non-representative: the sample covered multiple states but was not representative of their populations; single-state, representative: the sample was representative of the population of one state; and single-state, non-representative: the sample was not representative of the population of the state covered. We also recorded whether the survey was periodic (i.e. whether earlier rounds had been conducted or not). A survey conducted once with planned future rounds did not qualify as periodic.

Behavioural and biological risk factors

We tried to access the survey questionnaires, either through web searches or by contacting the study investigators, to identify the WHO-recommended core and STEPS behavioural risk factor indicators measured. An indicator measured by the questionnaire was considered to be the same as the WHO-recommended core or STEPS indicator if it met the indicator definition, regardless of the questions used. To record the indicators measured by surveys whose questionnaires were unavailable, we accessed the survey publications and used the indicator definitions in the surveys, if described, or the indicators reported in them. For the STEPS behavioural risk factor indicators, if a given indicator was not measured by a survey, we examined the questionnaire or indicator definitions to determine and record if: (i) the definition differed from that used by STEPS, or (ii) was not covered at all by the survey. We obtained the WHO-recommended core and STEPS biological risk factors measured by each survey from the relevant sections of the survey report, usually the methods section, or from the questionnaire, if available. We entered all information on the behavioural and biological risk factors measured by surveys into Microsoft Access 2007 (Redmond, United States of America).

The surveys measuring WHO-recommended core and/or STEPS indicators were examined according to their representativeness and periodicity. For WHO-recommended core behavioural risk factor indicators, we recorded which surveys measured the indicators for a particular risk factor completely or incompletely. A particular risk factor was considered to be incompletely measured if not all indicators

Fig. 1. **Results of search strategy to identify surveys collecting information on noncommunicable disease risk factors in India from 2000 onwards**
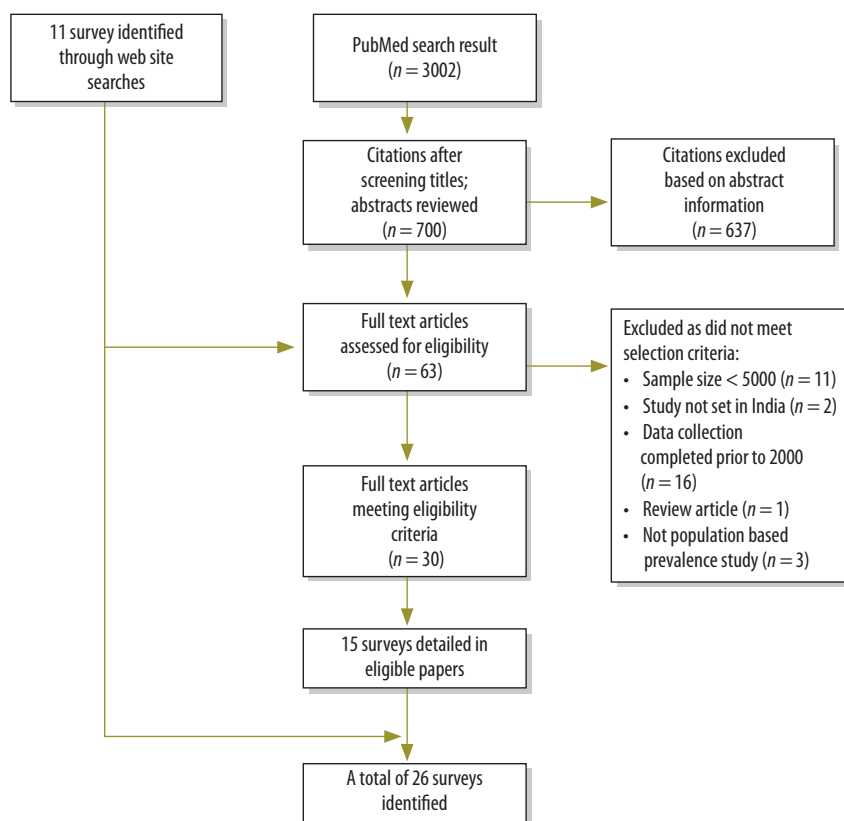
for that risk factor or not all indicator categories were measured in a survey. For each STEPS behavioural indicator, we recorded any "missed opportunity for measurement". We considered that an opportunity to measure a given STEPS indicator had been missed in either of the following situations: (i) for an indicator measured by at least one survey, an opportunity to measure the indicator was missed whenever another, more broadly representative survey failed to measure it because its definition differed from the one used by STEPS; (ii) for an indicator not measured by any survey, an opportunity to measure the indicator was missed whenever any survey failed to measure it because the indicator's definition differed from the one used by STEPS. Since large surveillance surveys in India have been conducted roughly every five years, findings between two five-year blocks, namely 2000–2004 and 2005–2009, were compared.

Results

The search strategy results are shown in Fig. 1. We identified 26 surveys – 16 for 2000–2004 and 10 for 2005–2009

(Table 1).[14–39] Of these surveys, seven (26.9%) covered only rural or urban populations or only males. Two (7.7%) were national and representative of states or regions; two (7.7%) were nationally representative only; seven (26.9%) were multiple-state, representative surveys; eight (30.8%) were multiple-state, non-representative surveys; one (3.8%) was a single-state, representative survey, and six (23.1%) were single-state non-representative surveys. Six surveys (24.0%) were periodic. Survey questionnaires were available overall for 16 (61.5%) surveys. Indicator definitions were given in the published reports of seven of the 10 surveys (38.5%) whose questionnaire was not available.

Behavioural risk factors

Table 2 shows the national and multiple state surveys that completely measured the WHO-recommended core behavioural risk factor indicators for at least one risk factor. National surveys measured only the WHO-recommended core tobacco use indicators completely in 2005–2009; they did not measure any of the other risk factor core indicators completely during either five-year

period. WHO-recommended core indicators for alcohol use were not measured completely by any survey, including single-state surveys, during 2000–2009. The other risk factors had their core indicators measured completely in at least one survey during 2000–2004 and 2005–2009. The representativeness of the surveys measuring the core indicators was somewhat better in 2005–2009 than in 2000–2004.

A substantial number of surveys measured the WHO-recommended core tobacco and alcohol use indicators incompletely (Table 2). Some of these surveys were representative of a larger geographic area than surveys that were already measuring tobacco use indicators completely. As for alcohol use, some surveys provided incomplete measurements; none measured core indicators of alcohol use completely.

Among the single-state, non-representative surveys, one measured tobacco use core indicators completely in 2000–2004, but none did so in 2005–2009. None measured the alcohol use, diet or physical inactivity indicators completely in 2000–2009 (data not shown).

Fig. 2 shows the percentage of STEPS behavioural risk factor indicators measured by the surveys. National surveys measured 20.0% of STEPS alcohol use indicators in 2000–2004 and 84.6% of tobacco use indicators in 2005–2009, and no indicators for diet and physical inactivity during 2000–2009. Overall, the percentage of STEPS indicators measured in nationally representative and multiple-state representative surveys was somewhat higher in 2005–2009 than in 2000–2004. Seven STEPS behavioural risk factor indicators were not measured by any survey after the year 2000 (Appendix A, available at: http://www.phfi.org/images/Publications/journals/Raban_et_al_WHO_Bulletin_2011_Appendix.pdf). There were many missed opportunities for measuring STEPS indicators because the indicator definitions used in the surveys differed from those used by STEPS (Table 3 and Appendix A).

Biological risk factors

Table 2 shows the WHO-recommended core biological risk factors measured by national and multiple-state surveys. National surveys measured only BMI in the two five-year periods we studied, but in 2000–2004 only females' BMI was measured. In 2005–2009, the

Table 1. **Household surveys collecting information on noncommunicable disease risk factors in India that met inclusion criteria for study**

Survey and year(s)	Population (age in years)	No. of states/ UTs covered[a]	Rural/ urban/ both	n	Periodic survey	Method for assessing behavioural risk factor indicators
National, representative of states or regions						
Global Adult Tobacco Survey,[b,14] 2009–10	≥ 15	31	Both	69 296	No	Questionnaire
National Family Health Survey – 3,[c,15] 2005–06	Females 15–49; males 15–54	35	Both	198 754	Yes	Questionnaire
National, nationally representative only						
Indian Human Development Survey,[16] 2004–05	Households	33	Both	41 000	No	Questionnaire
National Household Survey of Drug and Alcohol Abuse,[17] 2000–01	Males 12–60	24	Both	40 697	No	Indicator definitions
Multiple-state, representative						
WHO World Health Survey/Study on Global Ageing and Health[18,19]						
2007–2008	≥ 18	6	Both	12 198	Yes	Questionnaire
2003	≥ 18	6	Both	9 994	Yes	Questionnaire
Integrated Disease Surveillance Project Non-Communicable Disease Risk Factor Survey,[20] 2007–08	15–64	7	Both	38 054	No[d]	Questionnaire
Population Council's Youth in India Survey,[21] 2006–08	Females 15–24; males 15–29	6	Both	50 848	No	Questionnaire
National Nutrition Monitoring Bureau Surveys[22,23]						
2005–06	≥ 1	10	Rural	51 700	Yes	Indicators reported
2000–01	≥ 1	9	Rural	51 300	Yes	Indicators reported
Tobacco Use in Karnataka and Uttar Pradesh,[24] 2001	≥ 10	2	Both	64 084	No	Indicators reported
Multiple-state, non-representative						
Indian Study on Epidemiology of Asthma, Respiratory Symptoms and Chronic Bronchitis Phases 1 & 2[25,26]						
2006–09	15–85	14	Both	169 575	Yes	Questionnaire
2002–04	15+	4	Both	73 605	Yes	Questionnaire
Indian Council of Medical Research Risk Factor Surveillance[27,28]						
2005–06	15–64	6	Both	7 874	Yes	Questionnaire
2003–04	15–64	5	Both	39 429	Yes	Questionnaire
Cardiovascular Disease Surveillance in Industrial Settings,[29] 2002–03	20–69	10	Both	19 973	No[e]	Questionnaire
Prevalence of Diabetes in India Study,[30] 1999–02	25+	108 centres	Both	41 270	No	Indicator definitions
National Urban Diabetes Survey,[31] 2000	≥ 20	6	Urban	11 216	No	Questionnaire
Coronary Heart Disease Risk Factors in Northern India,[32] 1995–2000	≥ 15	3	Both	7 169	No	Indicator definitions
Single-state, representative						
Kerala Risk Factor Study,[33] 2003–04	30–74	1	Both	6 579	No	Questionnaire
Single-state, non-representative						
Tamil Nadu Diabetes and Risk Factor Survey,[34] 2006	≥ 20	1	Both	7 066	No	Indicator definitions
Diabetic Retinopathy Study, Theni District, Tamil Nadu,[35] 2005–06	≥ 30	1	Both	25 969	No	Indicator definitions
Chennai Urban Rural Epidemiology Study,[36] 2001–04	≥ 20	1	Both	26 001	No	Questionnaire
Trivandrum Oral Cancer Screening Study,[37] 1996–2004	≥ 35	1	Rural	164 072	Yes	Indicator definitions
Mumbai Cohort Study Follow-Up,[f,38] 1997–2003	≥ 35	1	Urban	90 282	Yes	Questionnaire
Substance abuse in Arunachal Pradesh,[39] 1998–2000	≥ 10	1	Rural	5 135	No	Indicator definitions

UT, union territory.

[a] India has 28 states and 7 union territories.
[b] Designed to be representative of six regions of India.
[c] Designed to be representative of states of India.
[d] This survey is planned to be periodic, but no other rounds conducted thus far.
[e] Post-intervention follow-up survey conducted in 2006 in intervention group (n = 5899) and control group (n = 907).
[f] Cohort baseline survey conducted in 1994–1997.

Table 2. **National and multiple state surveys in India that completely or incompletely measured core behavioural and biological noncommunicable disease risk factor indicators recommended by the World Health Organization**

Risk factor measurement	Number of surveys by representativeness							
	National, representative of states or regions		National, nationally representative only		Multiple-state, representative		Multiple-state, non-representative	
	2000–2004	2005–2009	2000–2004	2005–2009	2000–2004	2005–2009	2000–2004	2005–2009
Complete measurement								
Behavioural risk factors								
Tobacco use	–	1	–	–	–	–	1[a]	–
Alcohol use	–	–	–	–	–	–	-	–
Diet	–	–	–	–	1[a]	2[a]	1[a]	–
Physical inactivity	–	–	–	–	1[a]	2[a]	1[a]	–
Biological risk factors								
Body mass index (kg/m^2)	1[b]	1[a]	–	–	1[a,c]	3[c,d]	4[a,e]	–
Blood pressure	–	–	–	–	–	3[a,c,e]	3[a]	-
Fasting blood glucose	–	–	–	–	–	–	4[e]	1[a]
Cholesterol	–	–	–	–	–	–	2	1[a]
Incomplete measurement[f]								
Behavioural risk factors								
Tobacco use	–	1[a]	1	–	2[a]	4[a,c]	2[d]	1[a]
Alcohol use	–	1[a]	2	–	1[a]	4[c,d]	2[a]	–
Diet	–	–	–	–	–	–	–	–
Physical inactivity	–	–	–	–	–	–	–	–

[a] One survey is periodic.
[b] For females only.
[c] One survey in rural areas only.
[d] Two surveys are periodic.
[e] One survey in urban areas only.
[f] Incomplete measurement assessed only for behavioural risk factors, as biological risk factors are measured completely or not measured at all.

representativeness of the surveys in which blood pressure was measured improved with respect to 2000–2004, but blood glucose and blood cholesterol showed no change. Single-state surveys (data not shown) measured all biological risk factors during both five-year periods with the exception of blood cholesterol, which was measured only in 2005–2009 in a single-state survey.

Discussion

Surveillance of the major modifiable NCD risk factors in the population is essential for programme and policy planning, implementation and evaluation. This is particularly important for India, where the burden of NCDs has been increasing.[1–3] In this study we examined the availability of data measuring the WHO core and STEPS NCD risk factor indicators as collected by household surveys in India since the year 2000, and we highlight the gaps that need to be addressed to better inform NCD control in India.

The national-level survey data collected did not adequately cover the behavioural risk factor indicators and biological risk factors for NCDs. The WHO-recommended core tobacco use indicators and BMI were measured in a national survey only in 2005–2009. Multiple-state surveys, both representative and non-representative, filled some of the data gaps pertaining to behavioural and biological risk factors. The data collected in 2005–2009 showed improvements over the data collected in 2000–2004. This is not surprising since NCDs have begun to draw more attention as a public health issue in India in recent years. However, while many surveys included indicators of tobacco use, the remaining behavioural risk factors, namely alcohol use, diet and physical inactivity, were covered less frequently and less extensively. Additionally, many surveys measured the WHO-recommended core indicators incompletely, and opportunities to measure STEPS indicators were often missed because of the use of different indicator definitions. This underscores the need to standardize the approach to collecting NCD risk factor data.

The biological risk factors requiring blood samples (fasting blood glucose and blood cholesterol) were covered by surveys of smaller geographic representativeness than the surveys that included the biological risk factors requiring physical measurement (BMI and blood pressure). This is not surprising given that blood samples are more difficult and costly to collect. While biological risk factor data should ideally be collected on a larger scale than at present, it would be more practical for the health information system in India to begin by adequately covering core behavioural risk factors, with efforts to incorporate biological risk factors requiring physical measurements and blood samples when feasible. In this regard, the capacity for collecting biological samples in national surveys does exist in India, as has been demonstrated by the National Family Health Survey and the District Level Household Survey, in which blood

Fig. 2. **Proportion of STEPS behavioural noncommunicable disease risk factor indicators measured, by geographic representativeness of surveys in 2000–2004 and 2005–2009**
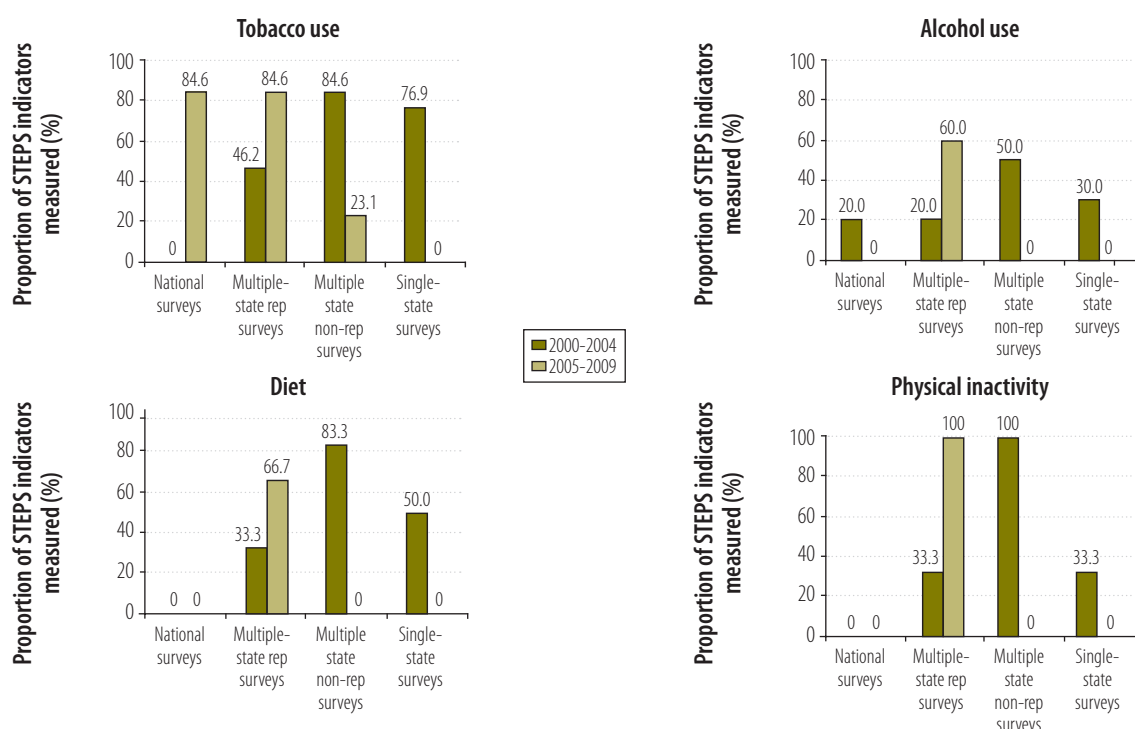
rep, representative; STEPS, STEPwise approach to surveillance.
Note: "National surveys" includes those surveys that were national and representative of states or regions as well as those that were nationally representative only; "single-state surveys" includes both representative and non-representative single-state surveys.

Table 3. **Number and percentage of STEPS indicators with a missed opportunity for measurement by any survey[a]**

Risk factor	No. of STEPS indicators	Indicators not measured			
		2000–2004		2005–2009	
		No.	%[b]	No.	%[b]
Tobacco use	13	6	46.2	2	15.4
Alcohol use	10	1	1.0	4	40.0
Diet[c]	6	3	50.0	2	33.3
Physical inactivity	3	1	33.3	0	0.0

STEPS, STEPwise approach to surveillance.
[a] For an indicator measured by at least one survey, an opportunity to measure the indicator was missed whenever another, more broadly representative survey failed to measure it because its definition differed from the one used by STEPS; for an indicator not measured by any survey, an opportunity to measure the indicator was missed whenever any survey failed to measure it because its definition differed from the one used by STEPS.
[b] Percentage of total indicators for each risk factor.
[c] Includes measures of fruit and vegetable consumption, oil or fat most frequently used for cooking and meals eaten outside the home.

samples to test for anaemia and HIV have been collected.[15,40] The collection and analysis of dried blood spots on filter paper have been investigated in India in recent years for the measurement of blood cholesterol as an easier alternative to collecting venous blood in large surveys.[41] Thus, with careful planning, blood sample collection for NCD risk factors could be incorporated into existing national surveys in India.

Surveillance of NCD risk factors should involve periodic standardized data collection to monitor, at appropriate levels of disaggregation, how risk factors in populations change over time. The health information system in India includes several large-scale surveillance surveys, but not all of them collect NCD risk factor data at present. Three rounds of the District Level Household Surveys have been conducted, each with a sample of 530 000 to 720 000 households.[40] However, the last two rounds conducted in 2002–2004 and 2007–2008 have not collected data on NCD risk factors. The National Family Health Survey, the Demographic and Health Survey in India, has begun including additional NCD risk factor data in the more recent rounds, but this could be further strengthened by also covering the core behavioural indicators and perhaps even blood pressure and blood cholesterol measurement, as in the Demographic and Health Surveys in other countries.[42] The new Annual Health Survey, conducted in the nine least developed states of India where half of the country's population lives, sampled over 3.6 million households in 2010[43] and included some NCD risk factor questions (results not yet published), with collection of biomarkers planned for subsequent rounds. These three large surveys are valuable resources, particularly because they are periodic, and they could be used to obtain the complete set

of WHO-recommended core NCD risk factors in future rounds. This would improve NCD risk factor surveillance and strengthen India's health information system by making it more compatible with current and projected disease distribution, while enabling the efficient use of resources. Careful consideration of priority indicators and their definitions would ensure standardized data collection and the core indicators and STEPS instrument could be a useful guide for this process.

Lessons can be learnt from countries comparable to India. In Brazil, NCD risk factor surveillance covers the STEPS behavioural risk factors and BMI.[44] Several surveys contribute to this information and a national health survey planned for 2013 will include blood pressure and other biological risk factor measurements.[44] In 2004 China initiated nationally-representative NCD risk factor surveillance surveys that are conducted every three years.[45,46] Both countries have longitudinal data on NCD risk factors, which is also possible in India if the collection of such data is integrated into the health information system, particularly in national surveys.

The inability to access all survey questionnaires is a limitation of this study, since it made it more difficult to document which indicators were measured by the surveys. Some of the indicators that were measured could have been missed because complete data are not always reported in publications. On the other hand, the number of indicators measured by some surveys may have been overestimated owing to the absence of indicator definitions. Importantly, this issue highlights the need for improved information sharing within the public health research community to contribute to the common goal of improving population health.[47] Another limitation of the study is that only surveys with sample sizes of 5000 or more were included in the analysis. Collecting

data involving physical measurements and blood samples is usually easier in smaller surveys. However, since all the core and STEPS biological risk factors were collected by the surveys we examined, the exclusion of smaller surveys is not likely to bias our main findings.

Ideally, the list of NCD risk factors to be monitored in a country should be titrated with the country's needs and capacity. We have suggested a shortlist of WHO-recommended core indicators, composed of the subset of STEPS indicators that is considered measurable in low- and middle-income countries,[10] as the minimum data set required for India. Measuring these core indicators should be feasible in large-scale national household surveys in India, which have relatively advanced capacity and are already collecting blood samples.[15,40] This will raise the cost of these surveys somewhat, but the benefits from having a complete small list of WHO-recommended core indicators would be far-reaching and would amply justify the expenditure. Additional STEPS indicators specifically relevant for India could also be considered. For example, data on chewable tobacco use and bidi smoking, both of which are highly prevalent in India, should be available. Indicators other than the WHO-recommended core and STEPS indicators may also be necessary for comprehensive programme monitoring and evaluation.[10]

NCDs are now recognized as a leading global public health problem, as demonstrated by the convening of the United Nations Summit on NCDs scheduled for September 2011.[48] As our findings suggest, efforts to control the increasing burden of NCDs in low- and middle-income countries involve establishing adequate systems for monitoring NCD risk factors and using these data to refine control strategies. The methods employed in this study could be applied in other countries to assess gaps in NCD risk factor data and integrate NCD risk

factor surveillance into national health information systems. A clear assessment of the data gaps would be helpful in developing relevant policy for better monitoring of NCD risk factors. At present, a lack of adequate risk factor data at the national and disaggregated levels and missed opportunities to measure indicators owing to a lack of standardized indicator definitions represent the most important gaps. Both could be addressed by adding appropriate standardized NCD risk factor indicators to existing large-scale periodic surveys that are national in scope but that can also be disaggregated to the state and regional levels.

This research highlights important deficiencies in India's health information system. Greater attention needs to be paid to this area of health systems research, which is largely neglected in India, to effectively and sustainably improve the health of India's population.[49,50] ■

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ملخص

توفّر معطيات رصد عوامل اختطار الأمراض غير السارية في الهند

الغرض فحص توفّر المعطيات لقياس مؤشرات عوامل اختطار الأمراض غير السارية من المسوحات المنزلية التي أجريت في الهند في الأعوام 2000–2009.

الطريقة جرى تحديد الاستبيانات والمطبوعات التي استخدمت في المسوحات المنزلية عن طريق الإنترنت والبحث في قواعد معطيات النشريات الطبية PubMed، وتم فحصها لتحديد ما جرى قياسه من مؤشرات أساسية لعوامل اختطار الأمراض غير السارية التي توصي بها منظمة الصحة العالمية. وقد أدرجت المسوحات التي بلغ حجم عيّنتها 5000 أو أكثر لضمان تحديد مستوى الدقة. وتم تقييم مقدار اكتمال قياسات المؤشرات الأساسية، والتمثيل الجغرافي للمسوحات.

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وغلوكوز الدم أثناء الصيام، وقيس كوليسترول الدم فقط في المسوحات دون الوطنية. ونتيجة لعدم استخدام تعريفات معيارية للمؤشرات، لم تكتمل قياسات المؤشرات الأساسية في بعض المسوحات الوطنية ودون الوطنية.

الاستنتاج المعطيات المتوفرة حول عوامل الاختطار الأساسية لرصد العبء المتزايد للأمراض غير السارية في الهند كافية غير. ويجب إدراج هذه المؤشرات باستخدام تعريفات معيارية في المسوحات الصحية المنزلية الوطنية الدورية لتوفير المعطيات على الصعيدين الوطني الإجمالي والجزئي.

النتائج لبى ستة وعشرون مسحاً معايير الإدراج في الدراسة. ومن بين المؤشرات الأساسية لعوامل الاختطار السلوكية الموصى بها من قبل منظمة الصحة العالمية، قيست العوامل التي ترصد استخدام التبغ بالكامل في المسوحات الوطنية ودون الوطنية؛ ولم تقاس العوامل التي تقيّم تناول الطعام والنشاط البدني إلا في المسوحات دون الوطنية، ولم تقاس العوامل التي تقيّم تعاطي الخمور على الإطلاق. ومن بين عوامل الاختطار البيولوجية الأساسية الموصى بها من قبل منظمة الصحة العالمية، قيس فقط مؤشر كتلة الجسم في المسوحات الوطنية ودون الوطنية، بينما لم يقاس ضغط الدم،

摘要

印度非传染性疾病危险因素监测数据的可用性

目的 旨在调查印度2000-2009年间进行的家庭调查中测量非传染性疾病(NCD)危险因素指标数据的可用性。

方法 通过互联网和PubMed医学文献检索服务系统检索确定了家庭调查中运用的调查问卷和相关文献，并对其进行了分析研究从而决定测量了哪些世界卫生组织推荐的用于非传染性疾病监测的核心非传染性疾病危险因素指标。研究包含了样本等于或大于5000的调查从而确保一定的精确程度。对核心指标测量的完整性和调查的地域代表性也进行了评估。

结果 26项调查符合纳入标准。世界卫生组织推荐的核心行为危险因素指标中,那些监测烟草使用的指标在国家级和次国家级调查中得到了完全测量;那些评估饮食摄入量和体能活动不足的指标仅在次国家级调查中进行了测量,而那些评估酒精饮用的指标则完全没有测量。而世界卫生组织推荐的核心生物危险因素中,仅身体质量指数在国家级和次国家级调查中进行了测量,而血压、空腹血糖和血液胆固醇仅在次国家级调查中予以测量。由于非标准指标定义的使用,一些国家级和次国家级调查中核心指标测量并不完整。

结论 印度用于监测非传染性疾病负担日益加重的核心危险因素指标方面数据的可用性不足。运用标准化定义的这些指标应纳入国家定期家庭健康调查中,从而提供国家水平和各分层次水平的数据。

Résumé

Disponibilité des données pour la surveillance des facteurs de risque des maladies non transmissibles en Inde

Objectif Examiner la disponibilité des données mesurant les indicateurs de facteurs de risque des maladies non transmissibles (MNT) à partir d'enquêtes auprès des ménages réalisées en Inde de 2000 à 2009.

Méthodes Les publications et questionnaires utilisés dans les enquêtes auprès des ménages ont été recensés par des recherches sur Internet et PubMed. Ils ont ensuite été étudiés afin de déterminer quels indicateurs principaux de facteurs de risque de MNT recommandés par l'Organisation mondiale de la Santé (OMS) pour la surveillance des MNT ils mesuraient. Les enquêtes ayant eu un échantillon supérieur ou égal à 5 000 ont été incluses afin d'assurer un certain niveau de précision. L'exhaustivité de la mesure des principaux indicateurs et la représentativité géographique des enquêtes ont été évaluées.

Résultats Vingt-six enquêtes répondaient aux critères d'inclusion. Parmi les indicateurs de facteurs de risque comportemental principaux recommandés par l'OMS, ceux vérifiant la consommation de tabac étaient intégralement mesurés par les enquêtes nationales et infranationales, ceux évaluant les apports alimentaires et le manque d'activité physique étaient uniquement mesurés dans les enquêtes infranationales, enfin, ceux évaluant la consommation d'alcool n'étaient aucunement mesurés. Parmi les principaux facteurs de risque biologique recommandés par l'OMS, seul l'indice de masse corporelle était mesuré dans les enquêtes nationales et infranationales, alors que la tension artérielle, la glycémie à jeun et le cholestérol sanguin n'étaient mesurés que dans les enquêtes infranationales. En raison de l'utilisation de définitions d'indicateurs non standardisées, la mesure des indicateurs principaux était incomplète dans certaines enquêtes nationales et infranationales.

Conclusion La disponibilité de données sur les indicateurs des principaux facteurs de risque permettant de surveiller la charge croissante des MNT est insuffisante en Inde. Ces indicateurs, utilisant des définitions standardisées, devraient être inclus dans les enquêtes nationales périodiques sur la santé des ménages pour fournir des données nationales et ventilées.

Резюме

Наличие данных, необходимых для мониторинга факторов риска неинфекционных болезней, в Индии

Цель Изучить, имеются ли в материалах обследований домохозяйств, проведенных в Индии в период 2000–2009 годов, данные, измеряющие индикаторы факторов риска неинфекционных болезней (НИБ).

Методы Путем поиска в Интернете и базе данных PubMed были выявлены использовавшиеся в обследованиях домохозяйств опросные листы и публикации, которые затем были изучены для определения того, какие ключевые индикаторы факторов риска НИБ, рекомендуемые Всемирной организацией здравоохранения для мониторинга, измерялись. С целью обеспечения определенного уровня точности были отобраны обследования с размером выборки 5 000 человек и более. Оценивались полнота измерения ключевого индикатора и географическая репрезентативность обследований.

Результаты Критериям отбора соответствовали 26 обследований. Среди рекомендуемых ВОЗ ключевых

индикаторов поведенческих факторов риска индикаторы, отслеживающие употребление табака, измерялись полностью как в национальных, так и в субнациональных исследованиях; индикаторы, оценивающие рацион питания и отсутствие физической активности, измерялись только в субнациональных обследованиях, а индикаторы, оценивающие употребление алкоголя, не измерялись вообще. Среди рекомендуемых ВОЗ ключевых биологических факторов риска только индекс массы тела измерялся как в национальных, так и в субнациональных обследованиях, в то время как кровяное давление, уровень глюкозы в крови натощак и уровень холестерина в крови измерялись только в субнациональных исследованиях.

Вследствие использования нестандартных определений индикаторов, измерение ключевых индикаторов в некоторых национальных и субнациональных исследованиях было неполным.

Вывод В Индии имеющийся объем данных о ключевых индикаторах факторов риска недостаточен для проведения мониторинга возрастающего бремени НИБ. Эти индикаторы, использующие стандартные определения, должны быть включены в планы периодических национальных обследований домохозяйств по вопросам здоровья с тем, чтобы иметь возможность получать данные на общенациональном и дезагрегированном уровнях.

Resumen

Disponibilidad de datos para la supervisión de los factores de riesgo de enfermedades no transmisibles en India

Objetivo Examinar la disponibilidad de datos que miden los indicadores de factores de riesgo para enfermedades no transmisibles (ENT) a partir de las encuestas domésticas realizadas entre los años 2000 y 2009 en India.

Métodos A través de búsquedas en Internet y en PubMed se identificaron los cuestionarios y publicaciones empleados en las encuestas domésticas. A continuación, se examinaron para determinar qué indicadores fundamentales de factores de riesgo se habían medido para las ENT siguiendo las recomendaciones de la Organización Mundial de la Salud (OMS) para la supervisión de enfermedades no transmisibles. Se incluyeron encuestas con un tamaño de muestra de 5000 personas o más para garantizar un nivel de precisión adecuado. Se evaluaron la integridad de la medición del indicador principal y la representatividad geográfica de las encuestas.

Resultados Veintiséis encuestas cumplieron los criterios de inclusión. De los principales indicadores de factores de riesgo conductuales recomendados por la OMS, los que controlaban el consumo de tabaco se midieron en su totalidad en encuestas nacionales y regionales; los que evaluaban la dieta y el sedentarismo se midieron únicamente en encuestas regionales y los que evaluaban el consumo de alcohol no se midieron en absoluto. De los principales factores de riesgo biológicos recomendados por la OMS, solo se midió el índice de masa corporal en las encuestas nacionales y regionales, mientras que la presión arterial, los niveles de glucosa en sangre en ayunas y los de colesterol en sangre se midieron únicamente en encuestas regionales. Debido al uso de definiciones de indicadores no estandarizadas, la medición de los indicadores principales en algunas de las encuestas nacionales y regionales fue incompleta.

Conclusión La disponibilidad de datos en India sobre los principales indicadores de factores de riesgo para controlar la creciente carga de enfermedades no transmisibles es insuficiente. Estos indicadores que emplean definiciones estandarizadas se deben incluir en las encuestas domésticas que se realizan periódicamente en el país para proporcionar datos a nivel nacional y desagregado.

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