Health Barometer 2010 Methods

Introduction

In order to evaluate healthy behaviours, the French Institute for Health Prevention and Health Education (Inpes) has conducted a series of general population surveys since 1992 (Baudier et al., 1993), called "Health Barometers", which analyse the opinions and attitudes of the French population with regards to health, and provide useful data to decision-makers in the field of public health. The 2010 Health Barometer is the fifth edition of this vast study and is one of the largest surveys conducted today, involving more than 25 health issues. While some parts of the questionnaire have changed since its introduction, a core question set has been defined. The exhaustive presentation of the Health Barometer 2010 methodology has been published in French (Beck *et al.* 2013).

These studies are national and cross-sectional telephone surveys. Relying on a representative random sample of the general population, the survey's methodology remained constant since 1992, but several improvements occurred in order to consider the evolution of phone equipment of the French population.

Design and sample

Study Design

The random surveys differ from the quota sampling commonly used by survey firms. Their principle is to draw *a priori* a finite sample of individuals or households from a sampling frame, sticking to this initial sample regardless of the level of acceptance of the respondents. Therefore it requires a great obstinacy in the effort devoted to contact randomly selected individuals and convince them to participate.

The telephone mode of collection is generally used in general population surveys on health behaviours or on sensitive topics in France (Bohet and al., 2011; Beltzer and al., 2011) as at the international level (Hu and al. 2011). In particular, this mode of data collection showed good performance in adult population for psychoactive substance use (Beck and al. 2010).

Sampling frame

There is no register of the French population that could be used as a sampling frame in France. The main alternatives, such as electoral lists, electricity subscription lists… are unsatisfactory because the coverage of the population is often partial. Hardly more than a decade ago, the French telephone main directory (*France Télécom*) was sufficient to insure a correct representativeness of the population living in France. Such a solution would not be acceptable any more today because of various factors:

- The strong proportion of dwellings that are voluntary not registered in the main directory (the "red lists"): in the final sample obtained during the Health Barometer 2010, the "red lists" represent 29 % of the individuals and 35 % of those equipped with a landline. These figures may be underestimated, since the individuals registered in red lists are a little more reluctant to answer the phone surveys. What is known about these "red lists" is that their phone

numbers begin with a “geographical” phone number (i.e. 01, 02, 03, 04, 05), as well as the ones registered in the directory.

- The increasing proportion of dwellings in full unbundling and who reach the telephony network by a unique operator other than *France Télécom*; these dwellings have a phone number starting by 08 or 09 and/or a geographical number (starting by 01, 02, 03, 04 or 05).

- The large proportion of dwellings that do not have any landline telephone, but for the quasi-totality, are equipped with a cell phone (approximately 12 % of the individuals in 2010 (Bigot and Croutte, 2012)).

Thus the sampling frame of the 2010 Health Barometer relied on telephone numbers generated randomly, that cover dwellings with landline phones (“white lists”, “red lists”, and numbers in full unbundling), as well as dwellings exclusively reachable on cell phone. Thus, approximately 99 % of the population was covered (Bigot and Croutte on 2010, Beck et al. 2012).

Finally, two samples were drawn: on one hand, households with a fixed line with a geographic number; on the other hand, households with a cell phone and that could not be reached by a geographical phone number, with or without a fixed line, and joined by their cell phone.

Sampling procedure

The Health Barometer was based on a two-stage random sample of people aged 15-85 years speaking French and living in metropolitan France. Residents of collective dwellings, hospitals and institutions were excluded from the target population. Private households with classical phones, whether in the telephone directory or not, were included in the sample, as well as people owning only mobile phones (12% of the whole sample, which was the current rate in France in 2010).

The first stage was household selection. For the landline sample, Survey Sampling International (SSI) firm randomly generated geographical phone numbers. This allowed households with confidential telephone numbers to be surveyed. The “cell only” sample was constituted independently from the landline sample, using the prefix assigned by the National Telecom Authority to each mobile phone provider. The suffix part of the phone numbers was then randomly generated.

The second step was a random selection of the respondent among the eligible subjects within the household, using the method suggested by Leslie Kish (1949). Only one person in each household participated. If a household or respondent refused or could not be contacted, there was no replenishment.

Data collection

The questionnaire was programmed using a computer-assisted telephone interviewing (CATI) system. Interviewing was conducted in French, respondents who did not speak French being excluded from the study. Data were collected from 22nd October 2009 through 3rd July 2010, all the days of the week except Sunday, by interviewers from a professional survey firm (GfK-ISL) who received a specific training for this particular health survey

The study protocol included: (a) a formal request to participate, explaining the objectives of the study that was delivered by mail before (or after for subjects with confidential numbers whose address was unknown) the first telephone call, using the reverse directory; and (b) a telephone interview. Unsuccessful calls were repeated 30 and 90 minutes later; up to 40 attempts were made, on different days and at different times.

If the randomly selected subject was not available, a pre-arranged time for the interview was suggested. In the event of a refusal to participate, the household was removed from the survey without being replaced to guarantee the random protocol. However, the interview could be interrupted and the interviewer proposed another appointment to finish the questionnaire.

In order to increase participation rates, households reluctant to participate were called again by a special team of trained interviewers. Those calls were attempted at least one week after the first call, at a different hour and day. Finally, the refusal rate obtained in the survey was 39% in both landline and mobile samples. The mean duration of an interview was about 32 minutes for landline phones and 34 for cell phones. The final sample comprised 27,653 persons (23,605 reached by landline telephone and 4,048 by mobile phone).

All collected data were anonymous and self-reported. The questionnaire collected data on health behaviours and attitudes, as well as socio-demographic background (gender, age, educational level, occupation, household composition and income). The whole population-based survey procedure was approved by the French commission on data privacy and public liberties (CNIL).

Weighting adjustments

Data were firstly weighted to account for the probability of selection of the respondent, using the number of telephone lines and the number of eligible persons in the household. They were also adjusted to the current French population structure (1990 census in 1992, 1995 employment survey in 1995, 1999 census in 2000, 2005 employment survey in 2005, 2008 employment survey in 2010), according to age, gender, region, level of urbanisation and educational level.

Strengths and weaknesses

The Health Barometer 2010 is based on a large sample representative of the French population. The questionnaire was composed of a large number of modules, which addressed the behaviour, attitudes, knowledge and opinions of French people relating to health matters. The methodology of the survey has been validated and interviews were conducted by trained interviewers. A major limitation however deserves attention in the interpretation of findings. The refusal rate obtained in the survey was 39%, which is satisfactory for such health surveys in France, but higher than the rates obtained in previous epidemiological surveys conducted in the 1990's (Beck *et al.* 2008). Thus, selection bias cannot be ruled out and some populations, especially the most deprived such as homeless people, are likely to be under-represented, even though some were interviewed thanks to the sample based on mobile phone numbers.

References:

Baudier, F., Dressen, C., Alias, F., 1994. Baromètre santé 92: Résultats de l'enquête annuelle sur la santé des français CFES, Vanves.

Beck, F., Gautier, A., Guignard, R., Richard, J.B., 2013. Méthode d'enquête du baromètre santé 2010. In: Beck, F., Richard, J.B. eds. Les comportements de santé des jeunes. Analyses du baromètre santé 2010. Saint-Denis pp. 27-55.

Beck F, Gautier A., Guignard R., Richard J.- B., 2011, Une méthode de prise en compte du dégroupage total dans le plan de sondage des enquêtes téléphoniques auprès des ménages, in Tremblay M.-E., Lavallée P., El Hadj Tirari M. (dir.), Pratiques et Méthodes de sondage, Dunod, Collection Sciences Sup, Paris, 310-314.

Beck, F., Guignard, R., Legleye, S., 2010. L'influence du mode de collecte sur la mesure des prévalences de consommation de substances psychoactives : Une comparaison entre EVS et le Baromètre santé 2005. In: Beck, F., Cavalin, C., Maillochon, F. eds. Violences et santé en France : Etat des lieux. La Documentation française, Paris, pp. 259-272.

Beltzer, N., Bigot R., Beck F., Toulemon L., David C., Grémy I., Warszawski J., *Vers une nouvelle méthodologie des enquêtes en santé réalisées à partir d'abonnés au téléphone*, in Tremblay M.-E., Lavallée P., El Hadj Tirari M. (dir.), *Pratiques et Méthodes de sondage*, Dunod, Collection Sciences Sup, Paris, 288-292.

Bigot, R., Croutte, P., 2010. La diffusion des technologies de l'information et de la communication dans la société française. Collection des Rapports du CREDOC (220).

Bigot, R., Croutte, P., 2012. La diffusion des technologies de l'information et de la communication dans la société française. Arcep, Credoc, Paris, pp. 290.

Bohet, A., Moreau, C., Projet fécond et fécond médecin. Séminaire IRESP "enquêtes en population générale sur internet", 9 février 2011.

Hu, S.S., Balluz, L., Battaglia, M.P., Frankel, M.R., 2011. Improving public health surveillance using a dual-frame survey of landline and cell phone numbers. American journal of epidemiology 173 (6), 703-711.

Kish L, A procedure for objective respondent selection within the household, Am Stat Assoc J, 1949; 44:380-381.

Beck F., Guilbert P., Gautier A., Arwidson P., 2008, L'acharnement téléphonique dans les enquêtes est-il justifié ?, in Guilbert P. Haziza D., Ruiz-Gazen A., Tillé Y., *Méthodes de sondages - Cours et cas pratiques - Master, écoles d'ingénieurs*, Dunod, Collection Sciences Sup, Paris, 254-259.