Portuguese National Health Examination Survey: Lessons From Data Collection Monitoring

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BACKGROUND

This work addresses practices related to quality control in the first Portuguese National Health Examination Survey (INSEF). We aimed at identifying errors and difficulties **in an early survey stage** to improve data quality.

INSEF is a cross-sectional population-based study representative at regional (7 Regions) and national level that aims to expand knowledge on health status, health determinants and health inequalities. It is developed by the National Health Institute Doutor Ricardo Jorge in cooperation with five mainland Regional Health Administrations and the Regional Health Offices of the Autonomous Regions of the Azores and Madeira and the Norwegian Institute of Public Health.

The survey encompasses three components:

Core physical measurements + Blood collection + Interview (CAPI)

INSEF target population comprised community-dwelling individuals aged between 25 and 74.
Survey sample was based on two-stage stratified cluster design. Sample size was established in 4200 at national level.

Data collection takes place between February – December of 2015 in 49 collection sites. It is carried out by trained teams each composed by two nurses, one laboratory technician and one administrative clerk (n=104).

METHODS

To ensure accurate and high quality data, a monitoring system was implemented as part of internal quality assessment. It includes:

Recruitment of participants
- Daily/weekly check of recruitment and participation;
- Interviewer performance evaluation;

Core physical measurements
- Monitoring of blood pressure and anthropometric measurements by interviewer and collection site;
- Evaluation of average time spent on measurements;

Blood collection & sample processing
- Monitoring of blood draw;
- Sample haemolyses;
- Duration of laboratory processing;

Interview (CAPI)
- Daily validation of collected interview data to verify completeness and identify duplicates;
- Regular clarification of issues raised in questionnaire administration.

For each region we carry out a first survey quality assessment at the end of the second week of fieldwork.

RESULTS

Results regard quality assessment of the first 3 collection sites with 88, 84 and 58 participants respectively (n=230 participants overall).

Recruitment of participants

- Monitoring allowed identification of items at higher risk of missing data and challenging issues such as employing exclusion criteria.

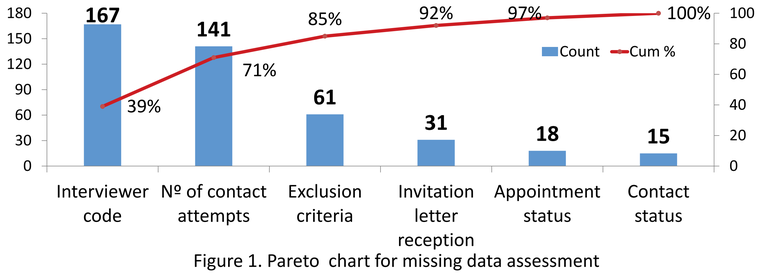

Figure 1. Pareto chart for missing data assessment

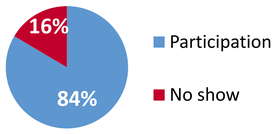

Figure 2. Appointment status

- Of all appointments scheduled about 84% resulted in participation. Based on monitoring data overbooking was adopted to adjust for "no show".

Core physical measurements

- Correct registry of time spent on blood pressure measurement was challenging for 3 interviewers, whose time measurements were below the expected minimum of 8 minutes.

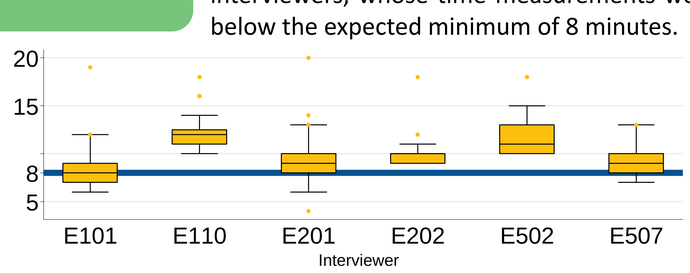

Figure 3. Distribution of blood pressure measurement duration by interviewer

- Monitoring allowed detection of errors on the evaluation of waist circumference, which was associated with interviewers terminal digit preference.

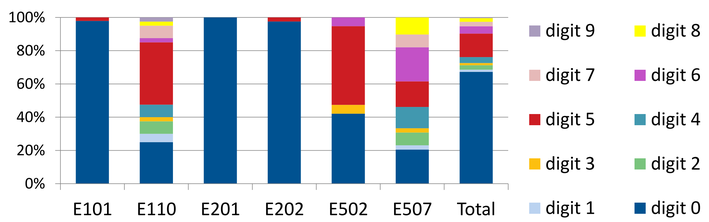

Figure 4. Distribution of terminal digit of waist circumference measurement by interviewer

- In the overall distribution of terminal digit readings, 67% were read to 0, 14% to 5, and only 19% to digits other than 5 or 0. This preference for 0's and 5's was consistent across interviewers. Additional training was performed to minimize digit preference and rounding errors.

Blood collection & sample processing

- Blood draw average time was 8 minutes. Samples for serum and plasma isolation were centrifuged within 60 minutes after draw.
- 94.8% of samples were collected with the participant in a sitting position. A second attempt was needed to blood draw in 18.3% of the participants.

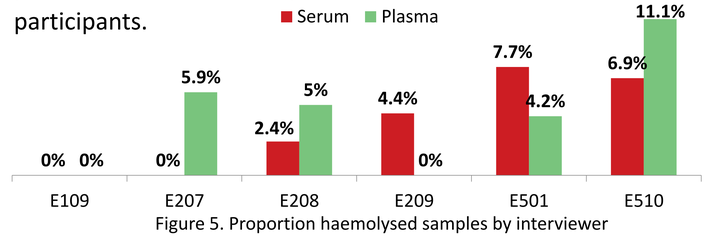

Figure 5. Proportion haemolysed samples by interviewer

- Junior laboratory technicians have higher rates of haemolysed samples, 11% compared to 0-6% from the most experienced.

Interview (CAPI)

- Questionnaire data was collected by computer assisted personal interview using REDCap[1] web application. Set of validation rules were implemented to control for:

Missing values + Implausible values + Inconsistency

- In daily validation for completeness, only 0.02% of 61180 data entries were missing.
- Also for 230 participants 4 duplicates of participants codes were detected.

- Regional meetings took place to discuss assessment results and propose recommendations for improvement.
- Monitoring of each fieldwork procedure allowed to provide on time feedback so fieldwork teams are able to implement correction actions aimed at reducing total survey error and improving survey quality.

CONCLUSIONS

- The data quality in a survey is of prime importance for accurate, reliable and valid results.
- Monitoring and systematic assessment of fieldwork are essential to guarantee standardized and high quality data and to early detect errors for rapid correction in health surveys with physical examination.
- Fieldwork teams' engagement is key to succeed in survey quality assessment and improvement.

REFERENCES

[1] P. A. Harris, R. Taylor, R. Thielke, J. Payne, N. Gonzalez, J. G. Conde, Research electronic data capture (REDCap) - A metadata-driven methodology and workflow process for providing translational research informatics support, J Biomed Inform. 2009 Apr;42(2):377-81.

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