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Evaluation of completeness of dengue records: exploratory study of compulsory notices

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ABSTRACT

Objective: To reflect upon the relationship between the information of health information systems and the decision making process in a health facility, through the assessment of the completeness of records of mandatory reporting and to subsequently discuss possible implications for the epidemiological surveillance of dengue and actions implemented. **Method:** This is a quantitative, qualitative, documental, exploratory and descriptive analysis of the proportion of filling in of the fields and subsequent classification of the completeness indicated. **Results:** Only the fields of identification and residence exhibited excellent filling in. The others showed deficiency in their completeness such as little continuity provided to epidemiological investigations and clinical signals. **Conclusion:** It is vital to train professionals to handle information systems, make them aware of the importance and the power of information, monitor it regularly to ensure its quality and recognize its social role in the health of the community.

Keywords: Information Systems; Disease Notification; Dengue; Epidemiological Surveillance

INTRODUCTION

Prevention and control of infectious diseases dates back to the advent of bacteriology at the beginning of the twentieth century. Such interventions occurred through the organization of large public health campaigns that aimed to control diseases that compromised the economic activity, such as yellow fever, plague and smallpox.

However, it was in the 1960s that epidemiological surveillance began to take shape, with the Smallpox Eradication Campaign. In 1969 its model inspired the organization of a system of weekly reporting of selected diseases, to collect data and develop preventive actions.

In the late 1980s, the national reform of the health sector created the Unified Health System (UHS), which incorporated the National Epidemiological Surveillance System (NESS), expanding in its legal text (Law 8.080/90)[1] the concept of epidemiological surveillance. Since then the actions have been operationalized within the reorganization of the Brazilian health system, based on the decentralization of responsibilities and comprehensiveness of service delivery.

To support these actions, data are collected from a health information system (HIS) defined by the Ministry of Health (MOH) as a "...set of administrative structures and production units, perfectly articulated, in order to obtain data through their record, collection, processing, analysis, transformation into information and timely dissemination"[2].

The most important HIS for epidemiological surveillance, the Information System for Notifiable Diseases (SINAN, in Portuguese), was developed between 1990 and 1993 to replace the Disease Compulsory Notification System (DCNS), designed by the National Epidemiology Center to be operated from health units, considering the purpose of collecting and processing data on notifiable complaints across the country, from the local level. The list of diseases has been established by the MOH, along with the ones considered most relevant to the health of the country.

In order for SINAN to be consolidated as the main information source of morbidity for reportable diseases, it is necessary to ensure both coverage and quality of information to support the decision making process, based on the principle of integrated care, which depends directly on the awareness of each health care professional about their responsibility as a citizen in improving population health.

To perform this evaluation, we have selected a disease of great prominence in the current epidemiology: dengue; due to its continued occurrence, interspersed with epidemics, since its resurgence in Roraima in 1986[3].

The compulsory notification forms are the instrument to collect the information provided in health care facilities and that will feed the SINAN. These consist of a range of information from different sources, encompassing personal, socioeconomic data and those related to the disease, which together allows us to trace an individual profile but when added to other occurrences can show the profile of a particular community.

Not all fields are required, which leads us to some reflections: are all grievances reported? If yes, are all of the fields of the notification form filled in? Has the information generated by these data determined (or influenced) the actions taken by the unit?

This paper aims to reflect on the relationship between the information from the health information systems and the decision making process in a health care facility.

The present study aims to assess the completeness of the registry of the compulsory notification form for dengue in a health care unit and discuss possible implications for decision making on epidemiological surveillance and health care actions implemented in its area of coverage.

The information generated by SINAN contributes to guiding interventions of services and to reduce the transmission through the detection of collective diseases and conditions of risk and vulnerability, as well as promote early confirmation of outbreaks and epidemics. Such objectives are achieved when health professionals are trained and have the responsibility to decide on strategies to control diseases and disorders, making updated information on such occurrences available. The nurse, whose job is focused on care, can and should direct his efforts in health promotion and prevention of health problems,

which is an activity that is directly benefited by the management of the information in question.

For this, one must value the compulsory notification, in particular its quality through the correct and complete filling in of the fields as this will generate information that can support decision making for actions that consider the completeness of health care of the users in the prevention of these diseases.

Finally, we turn to Moraes[4], who describes that the more and better information that is arranged, the better knowledge we will have on the population and thus will be able to consider alternative actions more consistently with the needs of the community.

METHOD

This is a quantitative, qualitative, documental, exploratory and descriptive research study. While the quantitative approach works with concrete, objective and measurable facts, the qualitative method addresses subjective issues that cannot be quantified. However, one should not think of opposition between them, since they can complement each other: "The quantitative study can generate questions to be qualitatively thoroughly analyzed"[5].

Regarding the type, this is a documental study, since the first phase includes data collection from written documents that have not yet received analytical and exploratory treatment. This is because it aims at formulating questions with the purpose of generating hypotheses, familiarizing the researcher with the phenomenon and performing a more precise and descriptive search since it "aims to discover the frequency with which phenomena occur, their relationship and connection with others, its nature and characteristics"[5].

We have performed the proportion analysis of completeness of the fields of Notification of Individual Specs (FIN, in Portuguese) of dengue forwarded by the Regional Polyclinic Largo da Batalha (RPLB) to SINAN between October 2009 to May 2010, since this disease

is typically seasonal and has an incidence mostly in the summer due to the combination of high temperatures with rain.

The RPLB is characterized by a secondary care level and covers the Pendotiba region, which encompasses the neighborhoods of Largo da Batalha, Sapê, Ititioca, Maceió, Badu, Maria Paula, Muriqui, Matapaca, Cantagalo and Vila Progresso, which contains one basic health care unit and eight modules of the Family Doctor Program, resulting in more than 100,000 users registered in the Unified Health System (105,000 until June 2009)[6].

This unit includes several services working in three shifts: medical consultations (general practice, obstetrics and gynecology, pediatrics, dermatology, endocrinology, cardiology and geriatrics), physical therapy services, nutrition, acupuncture, dentistry, vaccination room, laboratory exams, X-ray, ECG and dressing room, in addition to health programs focused on women's health, the elderly, hypertensive and/or diabetic patients, STD/AIDS, leprosy and oral health, and an Emergency Care Service (ECS) that is open 24 hours a day.

For the analysis of data completeness of the fields of FIN, a checklist was developed by the researchers consisting of three columns: the first field is identified by the corresponding number of dengue FIN, and the second and third are "filled" and "blank" respectively, marked according to the filling in of the form.

Next, a proportion analysis of filling in of the fields was carried out and to perform the interpretation of results the classification of completeness indicated by SINAN was used as follows: Excellent: equal or higher than 90%, Fair: 70% to 89% and Low: below 70%[7-8].

From the data obtained, we sought to identify possible relations between the unfilled fields and the process of decision making on actions taken by the community in the fight and prevention of dengue, to reflect on possible implications in the lack of filling in for the decision making process in the health care unit.

To the board of directors of the Regional Polyclinic Largo da Batalha authorization was requested for the development of this research through a letter containing objectives, reasons, methodology and purpose.

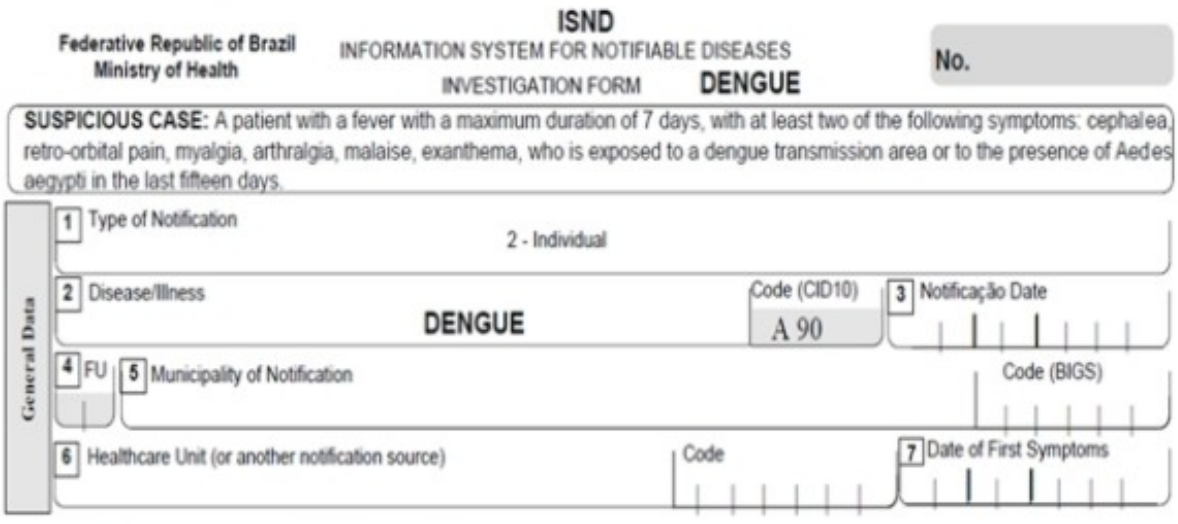
RESULTS

The complete filling in of FIN feeds SINAN, one of the most important HIS for public health. This, in turn, provides data and indicators such as incidence, prevalence, mortality and lethality of diseases/illnesses. However, in practice, there is a flawed, incomplete filling in, either for the impossibility of collecting the data, or by the simple depreciation of information as a subsidy for decision making.

The dengue FIN contains 66 numbered fields, plus additional observations and data of the researcher, grouped into the categories described below:

General Data (fields 01 to 07) - this contains basic information with data such as notification, disease, federal unit (FU), date, county and notification unit, and date of the first symptoms. It is noteworthy that the first two fields (type notification and disease/illness) are printed on the form, i.e. the forms already come to the health facilities with aggravation/disease identified.

Figure 1 - General data the investigation form of dengue, Niterói, RJ, Brazil, 2010



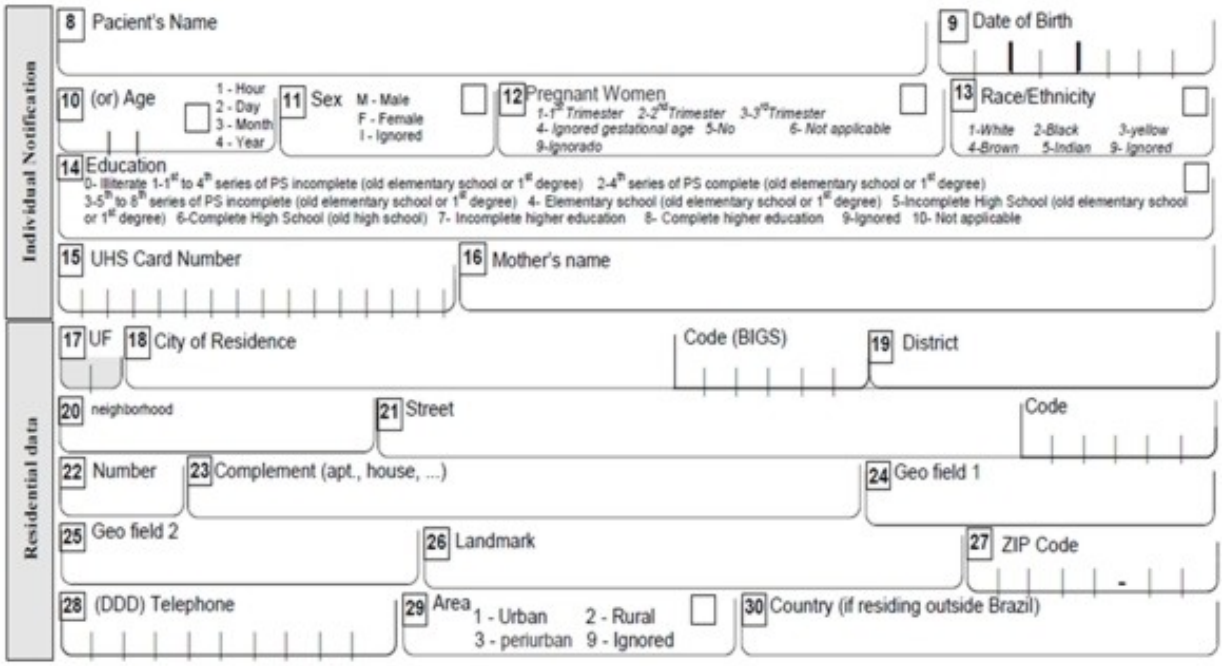
Source: Health Ministry of Brazil

Individual notification (fields 08 to 16) - this contains information on patient identification such as name, date of birth, age, gender, pregnancy, race/ethnicity, education, UHS card

number and mother's name. These data allow epidemiological profiling, as well as different strategies of action in preventing and combating dengue.

Residential data (fields 17 to 30) - this contains information about the patient's home, with data on federal unit, city of residence, district, neighborhood, street, number, complement, geofield, landmark, postal code, phone, area code and country. These data allow the mapping of exposed groups, the active search for cases and tracking of the vector mosquito spots. Grouped in greater proportion, they enable the mapping of areas of high and low incidence, which allows us to think more directly and effectively about strategies.

Figure 2 - Individual notification and residential data the investigation form of dengue, Niterói, RJ, Brazil, 2010



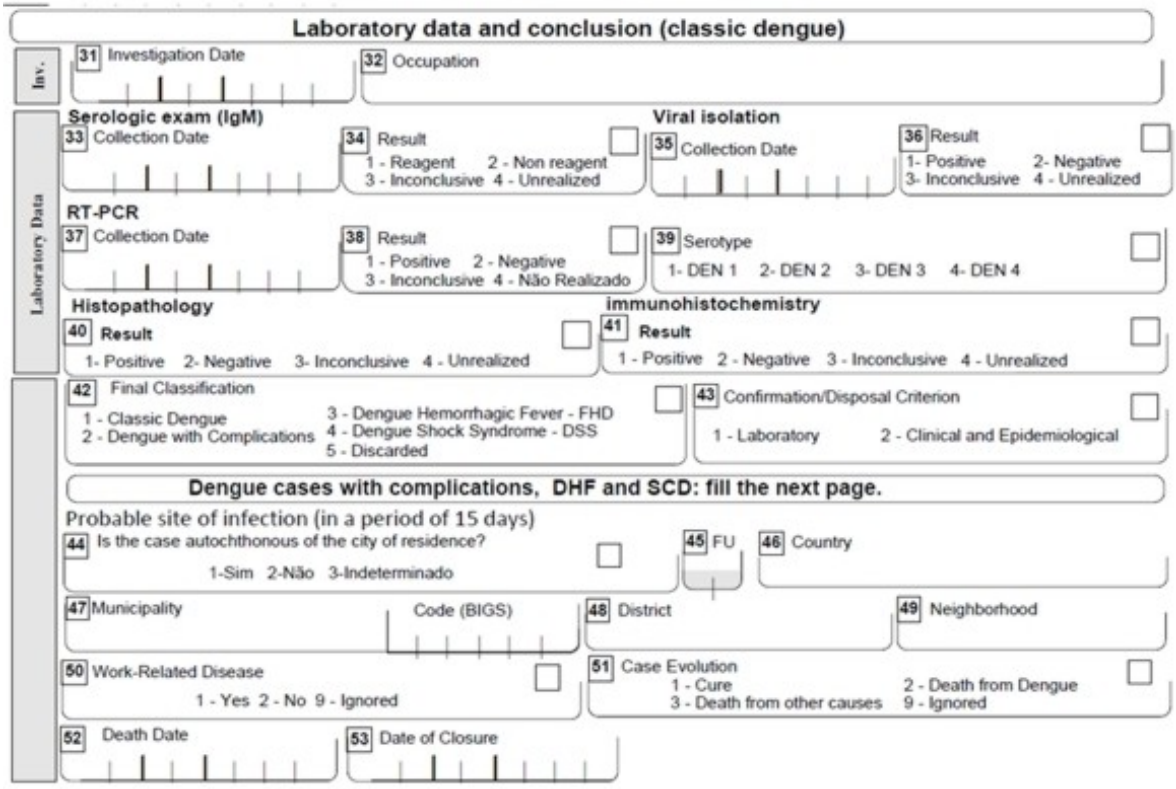
Source: Health Ministry of Brazil

Research (fields 31 and 32) - this corresponds to data such as date of investigation and occupation.

Laboratory data (fields 33 to 41) - this contains the results that enable the confirmation of suspected cases, as well as providing data for epidemiological studies. The information corresponds to data such as date of collection and results of serologic tests (IgM), virus isolation, RT-PCR, serotype, histopathology and immunohistochemical analysis.

Conclusion (fields 42 to 53) - this contains information about the confirmation and closure of the case, and it enables epidemiological studies to determine the source of outbreaks and epidemics. It corresponds to data as final classification, criterion for confirmation/disposal, suspected infection site, FU, country, county, district and neighborhood, whether it is a work related disease, progression of the case, date of death and date of closing.

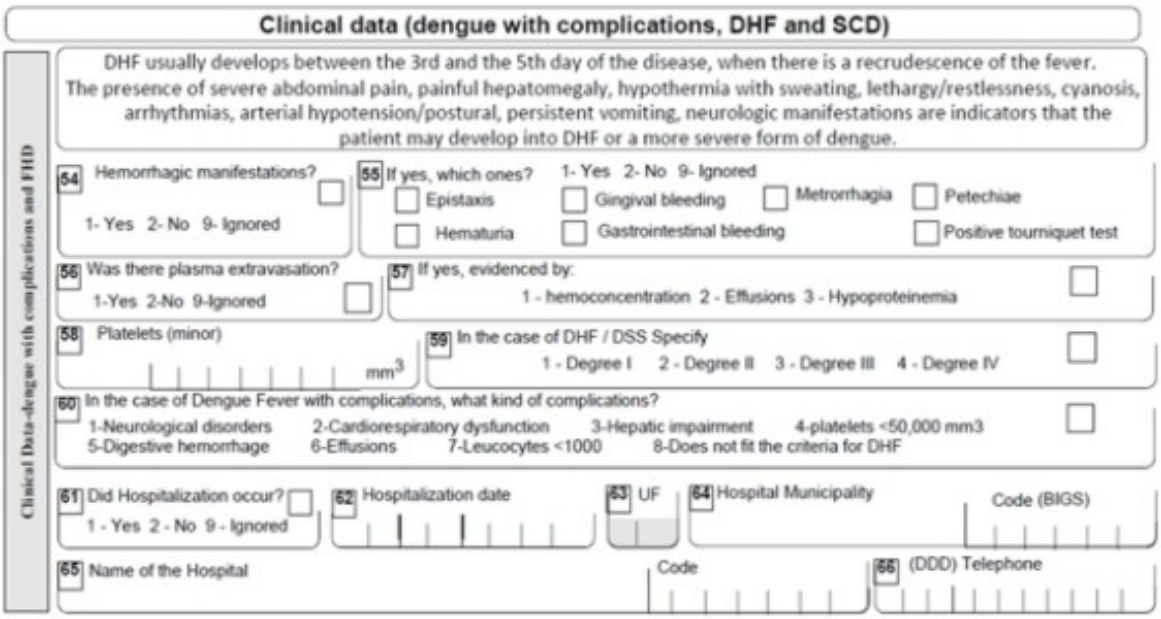
Figure 3 - Research data, laboratory and conclusion the investigation form of dengue, Niterói, RJ, Brazil, 2010



Source: Health Ministry of Brazil

Clinical data: dengue with complications and DHF (fields 54 to 66) - this contains information to follow the most serious cases, such as Dengue Hemorrhagic Fever and complications, with data as hemorrhagic manifestations, plasma extravasation, lower platelet count, DHF level, types of complications, hospitalization, date, FU, county, name and phone number of the hospital.

Figure 4 - Data from clinical investigation form of dengue, Niterói, RJ, Brazil, 2010

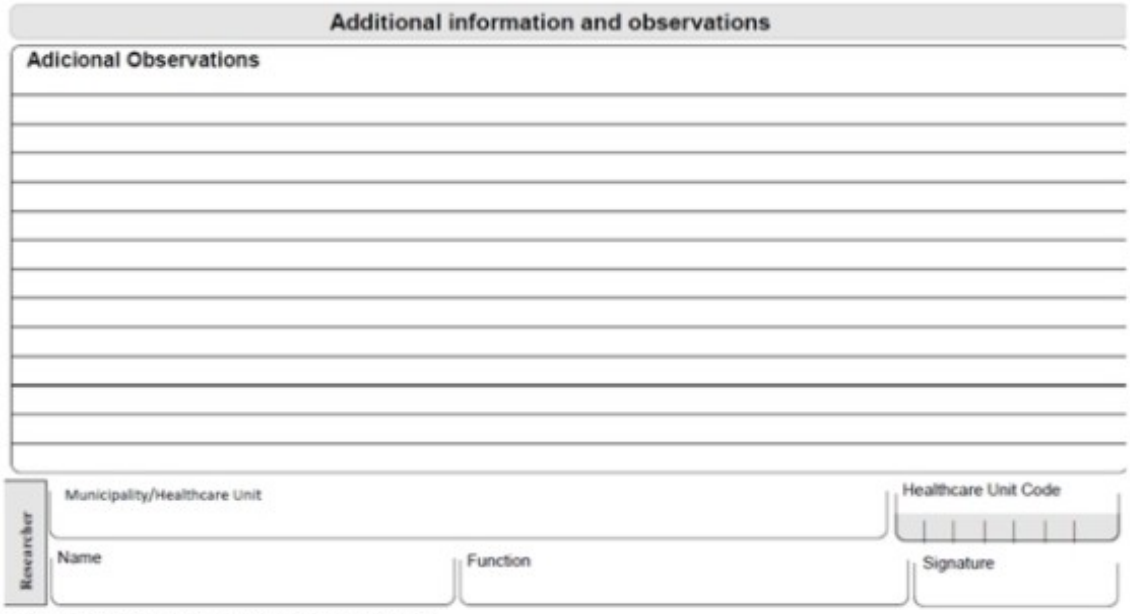


Source: Health Ministry of Brazil

Additional Notes - this area is reserved for additional information considered important for the professional to register.

Researcher – this is an area for the identification of the investigator/notifier, containing municipality, health unit and its code, name of the investigator, function and signature.

Figure 5 - Additional Notes and identification of the investigator's investigation form of dengue, Niterói, RJ, Brazil, 2010



Source: Health Ministry of Brazil

Of the forms analyzed, there were no forms from the month of October 2009, there was one form from November 2009, no forms from December 2009, one form from January 2010, two forms from February 2010, one form from March 2010, 15 forms from April 2010, thirteen forms from May 2010 and one form without a notification date, totaling 34 dengue FIN analyzed between October 2009 and May 2010. This variation can be attributed to the epidemiological characteristics of dengue, in which the occurrence is associated with high temperatures and rainfall, noting that the rainy season, particularly in 2010, occurred mainly in April, in addition to the fact that we are in the post-epidemic period.

For the analysis of the results, we considered the categories outlined in dengue FIN.

General data

We have observed that there was a rate of completeness of the fields between 97.05% and 100% (excellent), except those concerning the FU, whereby there was a rate of 5.88% (low). Taking into account that the health unit studied has a regional character within a municipal sphere, the absence of such data does not influence decision making and actions taken. However, when referred to the Federal Government, its absence may result in delays and errors in data processing and consequently in the reduction of its reliability.

Individual notification

In this category the identification fields such as 'name', 'age', 'date of birth' and 'gender', showed completion rates of 94.12% to 100% (excellent); fields such as 'pregnancy', 'race/ethnicity' and 'education' showed rates of 82.35% (fair); and for 'UHS card number' there was a rate of 0% (low). The Unified Health System card has been undergoing tests since 1999, which was the beginning of the pilot project[9], therefore justifying the incompleteness of this field.

Address information

This category showed large variations in the rate of filling in of the fields. Those related to ‘county’, ‘district’, ‘street addresses’, ‘address number’ and ‘phone number’ showed rates between 91.17% and 100% (excellent). However, the others which were ‘zone’, ‘FU’, ‘district’, ‘complement’, ‘geofield 1’, ‘geofield 2’, ‘landmark’, ‘postal code’ and ‘country’ presented rates between 0% and 55.88% (low). The absence or precariousness of these data increases the likelihood of errors in processing, which compromises the manager's decision making, undermines the search for cases, the epidemiological stratification of the risk of dengue fever and the development of prevention. Decree No. 78231 of 08/12/76, which regulates Law No. 6259 of 10/30/75, brings in its article 14, item I, whereby compulsory notification must contain precise information that allows the Health Authority to identify where the person with the disease can be found[10]. As for geofields 1 and 2, the lack of completeness can be justified by the fact that this is a strategy rarely used today.

Investigation

These fields presented a rate of 67.64% for ‘research date’ (low) and 76.47% for ‘occupation’ (fair). The fields that were "blank" showed significant numbers (32.36% and 23.53%, respectively), which may interfere with the development of dengue prevention strategies aimed at specific groups (students, formal and informal workers, housewives, etc.).

Laboratory data

These fields, related to ‘serologic exams and results’, ‘viral isolation and results’, ‘RT-PCR and results’, ‘serotype’, ‘histopathology’ and ‘immunohistochemistry analysis’ showed 0% fill (bottom). These data, when available, subsidize epidemiological surveillance as it

confirms the transmission of dengue viruses and allows the determination, along with other data, of its geographical distribution and clinical forms adopted at the present time[11]. They also contribute to the monitoring of indicators such as incidence and prevalence.

Conclusion - closing of the case

This category showed a low overall completion of fields, ranging from 0% for 'district', 'case evolution', 'death date' and 'closing date', and 2.95% for 'final classification', 'confirmation/disposal criterion', 'autochthonous case', 'FU', 'country', 'city', 'district' and 'work-related disease'. The absence of such data makes it difficult for epidemiological surveillance because without them you cannot specify what the course of events was, the location/region of origin of cases, potential populations at risk and implications in occupational health. Moreover, because we are not in an epidemic phase, reported cases may only be terminated with the test results for serology duly dated and the proper collection of data where the case/suspicion occurs, of which depends the quality of information generated.

Clinical data: dengue with complications and DHF

In this category, only the field 'platelets (smaller)' showed an excellent fill rate with a result of 94.12%. This is due to the necessity of obtaining the information as quickly as possible for the monitoring of hemorrhagic manifestations and complications. The other fields also had low completion rates, ranging between 0 and 2.95% for fields whereby the question was 'if yes, which ones?', 'was there plasma extravasation?', 'if yes, evidenced by', 'in the case of DHF/DSS specify', 'in the case of dengue with complications, what kind of complications?', 'hospitalization occurred?', 'date of admission', 'FU', 'hospital municipality' and 'telephone'. For the field 'hemorrhagic manifestations?' there was a rate of 44.12%. The presence of such data would allow the

monitoring of key indicators for decision making, such as mortality and lethality from dengue, and the clinic form(s) in progress.

Additional observations

All forms contained some information in this space, resulting in 100% fill (excellent). The information ranged from hematocrit, leukocytes and platelets result(s), if the patient was hospitalized or under observation at the unit, and one form presented an observation whether the contamination had occurred at the workplace. It has been observed that most of the data reported here (platelets, hospitalization and relationship between the disease and the work environment) contained specific fields to be filled. When the filling of such record is done in wrong areas of the form, it may generate conflicts of information, doubts, processing delays and under reporting.

Investigator

This category presented a varied filling in rate, between 0% to 61.76% (low) for 'unit code', 'municipality/health unit' and 'function', and 70.59% to 76.47% (fair) for 'name' and 'signature'. With regard to the role of the investigator, 5.88% were nurses, 8.82% were physicians, 47.05% were heads of health surveillance and 38.25% were blank. Although the identification of the investigator has presented a reasonable filling in rate, it has proven to be unsatisfactory since it reflects the little commitment of health professionals with the actions for health surveillance. We highlight here the action of nursing, whose participation was shy in the managerial process which is of significant importance to local decision making.

DISCUSSION

The completeness of the FIN fields of dengue at the Regional Polyclinic in Largo da Batalha, between October 2009 and May 2010, was rated as "low" for most fields. Only those variables relating to the identification presented completeness as "excellent."

High completeness of these fields and those related to the source of the individual and his residence possibly resulted from the fact that by not completing this would make it impossible to include the notification in SINAN. It is noteworthy that the completeness of the fields of the research is affected when the notification is not followed up with investigation or whether research data are not collected or recorded on FIN. Thus, despite the fact that the 'investigation date' field and others are mandatory for the inclusion in the investigation at SINAN, the notifications showed completeness lower than 100%, since there were some without investigation in the file. This will "contribute to the presence of secondary cases"[11].

Other important fields of FIN, such as those related to laboratory data and clinical data that are considered relevant for the closure and final classification of the case, showed low levels of completeness. Perhaps this was one of the reasons that almost all of the investigated cases were not confirmed or had even ended. It is understood that the degree of completeness of the reporting data may be influenced by the diagnostic services available, the control measures in operation, and the interests, resources and priorities of the authorities responsible for the control of disease and public health surveillance[8]. This situation strengthens the evidence suggested by this study regarding the need to combine efforts in order to raise awareness among health professionals about the role of information in the pursuit of quality health care and the improvement of population health.

Deficiencies in the coverage and quality of data occur because most health professionals consider the filling in of the instruments of data collection as a purely bureaucratic activity and of minor importance[12]. The aforementioned factors may have contributed to

the low completeness of dengue FIN at the health unit investigated, since during the epidemiological investigation of this disease, many data could not be collected in the first stage of the investigation. Possibly, a limited number of professionals in the sector responsible for health surveillance, associated with the huge number of attributes related to this service and the priorities that emerge on a daily basis will hamper or make it difficult for these professionals to seek such data in the appropriate time.

The lack of commitment of the professionals with the mandatory notification can also be a decisive factor for the deficiency of data quality. Likewise, there may be severe limitations on the internal flow of the places in which patients are treated and where the data is consolidated. Thus, it is essential to prepare health professionals regarding the importance of quality information, including other diseases[13].

Whatever the explanation, these findings leave no doubt about the need to improve the quality of data collection for epidemiological investigations and actions to prevent dengue. Deficiencies in filling in the form fields of epidemiologic investigation of the disease compromise the quality and relevance of the information available and consequently the decision making for effective epidemiological surveillance. The quality of information is directly related to the implementation of appropriate data collection where sanitation events occur[2].

The fact that the filling in of most fields of FIN of dengue in the unit concerned from October 2009 to May 2010 ranged from "average to low" completeness may indicate failure in the epidemiological investigation and demonstrates the need to work for awareness and sensitization of professionals about the importance. This is not only to investigate 100% of reported cases - since only 67.64% of notifications were investigated in the period - but also about the importance of filling out all fields of the epidemiological research form, including the timely closure of cases which showed no record in any of the reports analyzed.

It is extremely important that healthcare professionals who perform clinical care are informed that the absence of a request for specific confirmatory diagnostic tests for dengue, as observed in this study, undertakes a timely investigation of cases, especially in post-epidemic periods. Similarly, health professionals of epidemiological surveillance should ensure consistency in the information of SINAN from the filling in of FIN, especially in relation to the fields 'conclusion - closing cases', since this fault may hide the true magnitude of the disease in the region and negatively impact the development of prevention strategies. Thus, it is necessary that the surveillance seeks the return of laboratory results. Furthermore, information can also be supplemented by chart review and even by a home visit. The key step, however, is to update the information in SINAN, otherwise cases with confirmed diagnoses will remain pending for epidemiological surveillance.

Finally, the main implication for the lack of data on FIN is its influence on decision making. The decision process begins prior to the decision itself and consists of phases to be covered or not; which are: perception and definition of the problem, data collection and analysis, redefinition of the problem, search for alternative solutions, decision, implementation and evaluation[14]. Therefore, it is observed that data collection is the pillar of support for the process, since it is from this that the problem will be defined and that proposed solutions will emerge. That is, FIN is the source of information about the clinical and epidemiological course for dengue, which allows us to diagnose more accurately the needs of combat and prevention in each region. Its incomplete filling in generates less information and reduces its reliability, affecting an assertive decision making process. Quality information directly meets the demands of the population, reduces uncertainty and diminishes the risks associated with the process of decision making[15-17].

From this perspective, it can be noted that information means power to whoever holds it. Additionally, as addressed by Moraes[18] in his study, the information can be viewed from

several perspectives: under a technical point of view; as a controlling perspective; from a political point of view; as a changing factor; and from a social point of view as a possibility in which information becomes knowledge and this knowledge becomes an instrument for strengthening citizenship.

CONCLUSION

Health information systems have proven to be a powerful tool to be used by managers in decision making processes. However, for this to happen, all professionals need to be familiar not only with the system being used, but also with their goals and their importance for the management of health care.

The findings of this study demonstrate the need to invest not only in the training of health professionals through continuing education, but mainly on their awareness about the importance and responsibility of mandatory reporting of diseases. The quality of information is extremely important to support decision making, both in a local and in a central level, as it will allow managers to diagnose reliably the health needs of the population, thus corroborating to achieve UHS principles of comprehensiveness, equity and universality. Although the study points to a poor notification performance, its obligation and the penalty for noncompliance is provided in the Decree Law No. 2848 of December 07, 1940, art. 269[19].

It is also essential there is regular and frequent monitoring of data quality of SINAN banks in the three spheres of the government, analyzing the completeness of the records, the consistency between existing data and duplications.

As the deadline for closing investigations of suspected and/or confirmed cases is 60 days, it is pertinent to carry out a future revision of this work, given the proximity of their conclusion with notifications dates. It is noteworthy that this study addresses questions concerning the system health information and the document that feeds it: FIN. However,

one cannot say that the activities considered here as being absent are not implemented in practice, assuming only that they are not registered on FINs.

More studies are required to be developed to discuss this issue and fill in gaps of existing knowledge. It is believed that a study directly involving health care professionals of the unit will help to clarify the hypotheses raised here. But mostly, we should extend this research to the entire public health system, because although the data presented here does equate to those found in related literature, they may not reflect the reality of the municipality.

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