* Original Article

Public access to health information concerning neglected diseases in Brazil

Érika Silva Nascimento
Laboratório de Simulídeos e Oncocercose - Referência Nacional em Simulídeos, Oncocercose e Mansonelose - IOC, Fiocruz, Rio de Janeiro, RJ, Brasil
erikar@ioc.fiocruz.br

Marilza Maia-Herzog
Laboratório de Simulídeos e Oncocercose - Referência Nacional em Simulídeos, Oncocercose e Mansonelose - IOC, Fiocruz, Rio de Janeiro, RJ, Brasil
mherzog@ioc.fiocruz.br

Paulo Chagastelles Sabroza
Departamento de Endemias Samuel Pessoa, Escola Nacional de Saúde Pública Sérgio Arouca, Fiocruz, Rio de Janeiro, RJ, Brasil
sabroza@ensp.fiocruz.br

Abstract

To weigh the data on neglected diseases publicised by the Brazilian government, the categories adopted by SINAN Net (System of Information on Notifiable Diseases/Sistema de Informação de Agravos de Notificação) between 2006 and 2008 were surveyed. In the cases of diseases where local HIS (Health Information Systems) were used, the available data were compiled from scientific publications and governmental websites. An analysis of the data available at SINAN Net showed a lack of standardisation of the included categories. Although SINAN Net is the publicised version of SINAN, it does not make information such as the date of updating/insertion of data available in real time, which represents a major limitation to the use of such data. For the information afforded by SINAN Net to be effectively used for monitoring the public health actions and assessing their impact on the control of notifiable diseases, an analysis of the database quality must be performed on a consistent basis to identify and solve the problems of the lack and inconsistency of data and the duplicity of records for the public access to information to be reliable and to place local conditions into a nationwide, situational context.

Keywords: Collective health; health surveillance; health information; neglected diseases; SINAN Net.

Introduction

The Pan American Health Organisation (PAHO) defines a Health Information System (HIS) as a set of components (management structures, health statistics department and health information units) acting in an integrated manner to produce the necessary and opportune information to implement decision making within the health services system. According to the World Health Organisation (WHO), an HIS is not a mere mechanism to collect, process, analyse and transmit the information needed to organise and operate health services but is also a mechanism that permits research and planning that target the control of diseases (Castro, 2003, p. 238).

From a historical perspective, the broad development of information systems in Brazil is due to the following four main reasons: **a**) the production of information was centralised in the beginning of the 1960s as a national strategy to standardise and improve the quality of the statistical data available in the country; **b**) the information technology (IT) available at the time the information systems were established was based on mainframes, which contributed to the strong centralisation of the data

production; **c**) the scarcity of human resources for the management and production of information; and **d**) the strong political centralisation during the so-called "iron years", when several of these systems were created (Mota *et al.*, 1999, p. 505-521).

Therefore, an effective organisation of the national information systems was begun in the 1970s, which was a period of Brazilian political history signalled by an authoritarian military government with a strong centralising tendency and repression of individual freedoms (Loureiro, 2003, p. 26). The need to reorganise health services was discerned in the second half of the 1990s after the publication of the Organic Health Law, Law Nº 8,080, dated September 19, 1990.

Information in general, and health information in particular, became one of the most sensitive issues for virtually all societies. A broader scope of social rights, increased awareness, democratic practises and, in particular, advances in citizenship afforded new dimensions to consider the HIS anew. The notion of "information" itself became a subject of discussion, analysis and theorisation from the perspective of its comprehension as an economic and social factor connected to the technological development of the storage, handling and transmission of data, voices and images that characterise the "Age of Information" (Loureiro, 2003, p. 26).

Therefore, the "worship of information" must be understood as a theoretical and ideological construction with a material basis, where technology and theories grounded on physical- or mathematical-based symbolic logic are the elements that characterise the "Information Society". Such a "Society" has reproductive needs and strengthens the ideology asserting the metamorphosis of information into knowledge (Moraes, 1994, p. 172).

Integrated within the construction of the Federal Government's strategic agenda, the Health Ministry defined an elaboration of a policy for health information and IT in 2003 as one of its priority sectorial goals attuned to the international context, which highlights the relevance of sectorial policies and strategies of health communication and information as a function of the possibilities of developing new processes and products and of changing the institutional management models (Morris *et al.*, 2002, p. 85-88).

However, the construction of a national health information system is more a political, social and economic process than a technical process. This is the context in which the elements explaining the development, implementation and possible progression and conformation of the national health information system must be examined (Loureiro, 2003, p. 26). Another reason for why these systems must be scrutinised is that systems that were not originally intended for epidemiological surveillance, such as the Hospital Information System (Sistema de Informação Hospitalar - SIH), make important contributions to the assessment of the health conditions of the different Brazilian counties (MS, 2009, p. 148).

The publicised version of the System of Information on Notifiable Diseases (Sistema de Informação de Agravos de Notificação - SINAN Net) was implemented in 2007. SINAN Net contains numerous data needed for the estimation of the main epidemiological and operational indicators used for assessments at the local, municipal, state and national levels (SVS/MS, 2008, p. 108). This inclusion indicates that the information dissemination is undergoing the last stage of a process chain of information elaboration because the information and data were already defined, collected, stored and treated. However, the emphasis should have fallen on the dissemination from the beginning of this process in regard to the definition of systems, including the need to integrate several databases in the analysis of tendencies and conditions of health at the local level (MS, 2009, p. 148).

As the HIS underwent major alterations since its inception for improvements to meet the needs of health surveillance at the federal, state and municipal government bodies and as a function of the biogeographical characteristics of Brazil, i.e., a tropical country with continental dimensions exhibiting wide biological and sociocultural diversity that is currently classified as a developing country by the International Comparison Programme, it is easy to understand why some of the diseases that contribute to the maintenance of inequality still exist, such as diseases that not only prevail under poverty conditions, but that primarily represent a major hindrance to development are known as "neglected diseases" (DECIT/MS, 2010, p. 200-202).

According to Lindoso and Lindoso (2009, p. 247-253), the main countries exhibiting the lowest human development indexes (HDI) are located in the tropical and subtropical areas of the planet, whereas poverty is intrinsically related to the occurrence of the abovementioned diseases. Brazil ranks 70th in the HDI and has a high concentration of most of the so-called neglected diseases.

These diseases are considered to be neglected due to a lack of investment in the development of new drugs, diagnostic methods and vaccines, and to the poor efficacy of control programmes independent from the use of a nationwide or local HIS. Although financial resources are effectively allocated to research on these diseases, one of the undeniable reasons explaining the current state of affairs is the pharmaceutical industry's meagre interest in neglected diseases, which is due to their low potential profit, because these diseases affect low-income populations and mostly developing countries (DECIT/MS, 2010, p. 200-202).

Therefore, the present study aimed to weigh the data available on SINAN Net and other sources publicised by the Brazilian government on neglected diseases according to the PAHO – Brazil criteria, which include schistosomiasis, acute Chagas' disease, American tegumentary leishmaniasis (ATL), visceral leishmaniasis (VL), Hansen's disease, filariasis and onchocerciasis.

Methods

The categories adopted by SINAN Net for each neglected disease and the number of confirmed cases per year, based on the 1st symptom in the federated units (FU) of notification, from 2006 to 2008 were surveyed. In the cases of diseases where the local HIS was used, the available data were compiled from scientific publications and governmental webpages. The latter represent the only available source of information because only the control programmes have access to the health data of the affected populations. Variations in the nomenclature and definition of each disease are related to how the indicators express their components and thus disclose the specific epidemiological features of each disease. The analysis of the publicised data was grounded on a geographical territory-based descriptive ecological study.

Results and Discussion

The analysis of the data made available by SINAN Net showed a lack of standardisation in the categories it adopted. Considering that the diseases of interest exhibit different epidemiologic characteristics, it is reasonable for an HIS to adopt some specific categories that are particular to each disease. However, a closer examination of the categories adopted by SINAN Net for each disease also shows a notable lack of interaction in the cases of the categories related to basic information that should exhibit a standardised and mandatory nomenclature. One example is afforded by the category "Federative Unit", which is represented as "FU Infection" for acute Chagas' disease and as "FU F. Infection" for schistosomiasis, ATL and VL. Additionally, the hand-written research form for acute Chagas' disease includes the category "FU F. Infection" for autochthonous cases of disease, and the forms for the other diseases include the category "FU Infection", which is not included in SINAN Net, thus showing that some categories are omitted in SINAN Net. A similar example is that age-range, detailed age-range, and age-range <> 10 years old are not included in the forms, which list age instead.

Moreover, the inclusion of data into SINAN Net underwent a fast growth since its implementation (Table 1), especially after the Unified Health System (Sistema Único de Saúde - SUS) was effectively decentralised, which resulted in a direct benefit for some of the diseases considered in the present study.

Table 1 – Number of confirmed cases per year, based on the 1st symptom in the federated units (FU) of notification in 2006, 2007 and 2008, of neglected diseases included in the List of Notifiable Diseases (LND)

FU	Schistosomiasis			Acute Chagas' disease			ATL			VL			Hansen's disease		
	2006	2007	2008	2006	2007	2008	2006	2007	2008	2006	2007	2008	2006	2007	2008
RO	14	63	38	0	0	0	10	1039	1002	0	3	0	1522	1377	1230
AC	0	1	2	0	0	0	66	1004	1060	0	0	0	597	302	293
AM	0	0	1	0	28	0	14	2271	1894	0	2	4	997	951	973
RR	0	0	0	0	0	0	7	343	356	0	2	3	315	276	237
PA	1	4	8	0	123	86	125	4511	3796	56	373	345	5709	5290	5511
AP	0	0	1	2	12	26	8	704	679	0	2	0	239	181	259
TO	0	3	1	0	1	5	38	509	426	19	431	498	1524	1488	1498
MA	0	3	30	0	2	5	64	2435	1754	27	308	402	5373	5054	5009
PI	0	6	2	1	0	1	8	158	126	41	375	447	1810	1860	2264
CE	1	54	41	0	0	1	25	960	897	29	594	562	2673	2881	2898
RN	16	223	70	0	0	0	1	8	7	5	78	101	348	429	330
PB	9	139	117	0	0	0	0	62	66	5	28	34	1047	953	869
PE	307	4105	2384	0	0	0	19	485	420	10	75	84	3789	3535	3227
AL	32	160	74	0	0	0	1	120	93	6	34	21	494	465	459
SE	310	679	69	0	0	0	0	6	10	8	80	32	635	649	531
BA	1834	1954	2051	0	0	0	70	2101	3343	35	226	200	3526	3444	3357
MG	85	1281	3443	0	0	0	45	1462	1233	42	428	548	2776	2479	2188
ES	309	3558	2219	0	0	0	6	123	89	0	0	6	1337	1343	1230
RJ	10	140	145	0	0	0	3	143	71	0	3	0	2857	2561	2374
SP	221	1555	1203	0	0	0	28	416	408	31	265	313	2632	2610	2571
PR	23	296	175	0	0	0	14	482	569	0	3	3	1757	1556	1541
SC	0	9	6	0	0	0	5	79	103	1	0	1	254	254	246
RS	0	4	7	0	0	0	1	10	10	0	0	3	251	227	219
MS	0	6	3	0	0	0	6	109	142	19	241	254	684	658	726
MT	2	22	12	0	1	0	35	2897	2670	5	39	55	3652	3487	3100
GO	2	21	9	0	0	0	17	279	380	1	20	28	3584	3186	3261
DF	2	24	13	0	0	0	2	72	42	5	59	59	401	386	382

Data source: SINAN Net, April 2011.

In the case of schistosomiasis, the application of information technology to the Health Information System of the Programme for Control of Schistosomiasis (Sistema de Informação em Saúde do Programa de Controle da Esquistossomose - SISPCE) was a result of the decentralisation of the actions related to the control of this endemic disease between 1999 and 2000, and it is currently implemented in 20 Brazilian states (SVS/MS, 2005, p. 813). The data for 2006 to 2008, which are available at SINAN Net, show that the level of data registration in SISPCE was low in 2006 and exhibited a remarkable increase in 2007, which was maintained in 2008. This process thus coincided with the period when the decentralisation of actions was intensified, which was a consequence of the municipalisation of the use of faecal smear exams and the later application of information technology to the results. This progressive increase of the records also coincided with a restructuring of the control actions at the state and municipal levels.

However, the insufficiency and lack of definition of the methods encompassing all localities in the endemic areas and applied on a regular basis hinder the performance of a more reliable analysis of the current situation of schistosomiasis (Farias *et al.*, 2007, p. 235-239). The SISPCE currently reflects the model adopted for the control of endemic diseases at the county level, which was derived from the centralised and vertical structure that traditionally shaped the schistosomiasis control programmes in the past. Thus, The SISPCE affords operational data, but little information that might translate into epidemiological indicators useful for the effective control and surveillance of schistosomiasis. Destructuring of actions during the post-decentralisation period significantly contributed to a deficient registration of data into the system, resulting in inconsistency and an irregular registration of data.

As the reformulation of the information system was crucial to making control actions effective, Ruling Nº 2,472 from August 31, 2010 defined schistosomiasis as a notifiable disease in non-endemic areas (all the cases included in SINAN), whereas the cases detected in endemic areas are included in SISPCE, and the severe forms, such as acute, hepatosplenic, liver abscess, associated infections by enterobacteria, neurological (schistosomiasis myeloradiculopathy), nephropathy, vascular pulmonary, gynaecological, intestinal pseudo-tumour, etc., are notified and investigated using the Notification Form – Schistosomiasis of SINAN Net. The boxes relative to the case-related data on this investigation form will be altered in the near future, as will the definition of schistosomiasis to comply with the stipulations in the abovementioned ruling. Meanwhile, the traditional form is being used (SVS/MS, 2011, p. 1).

Acute Chagas' disease was included among the notifiable diseases by Ruling Nº 5 from February 21, 2006. Although this inclusion is quite recent, it was promptly incorporated into the data-processing routine at the health services, thus facilitating the access to information. Epidemiological investigations and the eventual discovery of new cases to detect and block the mechanism of transmission involved are performed by the municipal or regional epidemiological surveillance systems (SVS/MS, 2005, p. 813). Moreover, it may be asserted that the prevention and control of diseases involve the adoption of effective measures, among which educational actions stand out. This process demands the active participation of the population to allow for the appropriation of knowledge aimed at the transformation of the social-sanitary conditions. In the case of Chagas' disease, both the population and health services must participate in discussions on approaches for its prevention, treatment and control, including mechanisms to facilitate the access to information and the understanding of the correlation between social coexistence and the factors predisposing to and facilitating the appearance of the disease.

The Health Ministry recommends that educational actions in health must be included in all services that perform surveillance and control actions, including the ones related to American tegumentary leishmaniasis (ALT). Additionally, all of the severe or potentially severe adverse reactions to the ALT treatment must be reported to the sanitary authorities. According to Ruling Nº 2,472 from August 31, 2010, each and every case of ALT must be mandatorily reported to the local health authority. Epidemiological investigations must be started within 48 hours after the notification is made to assess the need to establish pertinent control measures. This investigation must be concluded within 180 days after the notification. The notifying health unit must use a SINAN Net investigation form and then refer it for processing according to the flowchart established by the Municipal Department of Health. Because ALT became a notifiable disease in 2006, there was a remarkable increase in the corresponding publicised data beginning in 2007, in addition to the confirmation of autochthonous cases in all Brazilian federated units.

The Programme for ALT Surveillance is aimed at achieving an early diagnosis and treatment of the detected cases to reduce the deformities caused by this disease. A website was launched to support the ALT surveillance and monitoring in Brazil, which affords access to the up-to-date consolidated epidemiological information and online-based interaction between the National Coordination of the ALT Control Programme at the Secretary of Health Surveillance of the Health Ministry (Secretaria de Vigilância

em Saúde do Ministério da Saúde - SVS/MS) and the municipal and state coordinators of this programme (SVS/MS, 2011, p. 1).

Although visceral leishmaniasis (VL) was established as a notifiable disease by Ruling Nº 1,461 from December 22, 1999, until 2006, the available data was derived from a passive detection of cases because an analysis of the number of confirmed cases registered by SINAN Net shows a substantial increase in 2007. However, the number of individuals exposed to infection or asymptomatically infected is much higher than the number of detected cases in some areas due to the occurrence of a subclinical infection in urban areas that results from the permanent human exposure to infecting stings (Moreno *et al.*, 2002, p. 37-39).

As a function of the significant increase in the number of VL cases recorded in Brazil and the expansion of the affected area, the WHO rated VL as a priority among the tropical diseases (WHO, 2001, p. 1). In endemic countries, VL is still neglected by the private economic sector; therefore, only the public sector invests in the development of new drugs and more efficient diagnostic methods despite its scarcity of resources and the inadequacy of its infrastructure. Brazil currently faces an expansion and urbanisation of VL including human cases and a large number of infected dogs in several medium- and large-sized cities. The transmission cycle that occurred in the wild and rural environments in the past is also currently present in urban centres (Gontijo *et al.*, 2004, p. 338-349).

Therefore, the Programme for VL Control was instituted to reduce the lethality rates and morbidity of this disease by means of an early diagnosis and treatment of human cases and by diminishing the risks of transmission through the control of the population of reservoirs and vectors. These major changes are related to the decentralisation and unification of actions in the field of public health, which increased new expectations in regard to the control of VL. Although the control strategies seem theoretically appropriate, the prevention of vector-borne diseases is quite difficult to achieve in actual practice, especially when such prevention is associated with the existence of domestic and wild reservoirs and some environmental features, including the physical use of inhabited spaces (Gontijo *et al.*, 2004, p. 338-349).

Analysis of the number of confirmed cases of Hansen's disease in SINAN Net showed that the diffusion of data in the Brazilian states has been well established since 2006. Hansen's disease was included among the notifiable diseases since Ruling Nº 1,461 was promulgated on December 22, 1999, and its control is based on an early diagnosis, treatment and cure to eradicate the sources of infection and avoid its sequelae. However, detection of new cases among the population younger than 15 years old was adopted as the main indicator in the monitoring of this endemic disease. This indicator was aimed at a reduction of 10% by 2011, and it is included in Programme of Increased Health: A Right of Everyone – 2008-2011/Programme for Growth Acceleration. Joint Ruling Nº 125 from March 26, 2009 established the operational guidelines for the National Programme for Control of Hansen's Disease (Programa Nacional de Controle da Hanseníase - PNCH) to perform several joint and integrated actions to facilitate the assistance of the affected population in regard to their needs and rights at all levels. Without losing sight of the challenge posed by horizontalisation and decentralisation, the PNCH actions were distributed across the following five components/areas: epidemiological surveillance; management; integral assistance; communication and education in health; and research. Communication and education in health is one of the structuring components of the PNCH and includes the following three axes: health communication actions, permanent education and social mobilisation, which explain the soundness of the publicised data (SVS/MS, 2008, p. 1).

A shift was observed in the data on the disease distribution that use the local HIS, such as filariasis, only after the implementation of an epidemiological monitoring system in the state of Pará, which was adopted by the Programme for Control of Lymphatic Filariasis in Brazil. In 2000, the endemic areas were the states of Pará, Pernambuco and Alagoas (CENEPI/MS, 2000, p. 1). Additionally, according to the most recent information, dated 2005, the city of Belém is the focus of attention in Brazil as the first filariasis endemic area to earn a certification of disease control on the path to elimination by the HM and WHO because no positive cases were found among the population investigated by means of serological, haemoscopical, entomological and molecular biology tests.

Meanwhile, the National Filariasis Reference Centre of the Aggeu Magalhães Research Centre in Recife is developing a project in that city to investigate the cases of filariasis since 2003. However, according to Rocha (2005, p. 1) the paths of research and epidemiological surveillance in that area must still be defined. This fact was confirmed and presented by the Technical Management of the Programme for Elimination of Filariasis (2006) because the Pernambucan Recife, Olinda, Jaboatão dos Guararapes and Paulista counties still exhibit substantial rates of infection, which differs from that of Maceió, in Alagoas,

that currently exhibits areas of low transmission and conditions of imminent control. São Luiz, in Maranhão, and Salvador and Castro Alves, in Bahia, must still be assessed to be granted certification of control on the path to elimination.

In the case of onchocerciasis, which is restricted to the Yanomami Indians' territory, the System of Information on Indigenous Health Assistance (Sistema de Informação da Atenção à Saúde Indígena - SIASI) was established in 2000 as a part of the National Policy for Assistance of the Indigenous Peoples Health. SIASI allowed for the collection, processing and analysis of the information needed for monitoring the indigenous communities' health, including deaths, births, morbidity, immunisations, production of services, human resources and infrastructure. Despite being promising, the reports elaborated by the National Health Foundation (Fundação Nacional de Saúde – FUNASA) based on SIASI data and the analysis of the input and use of that system by professionals in several districts pointed to a low reliability of information. SIASI was thus extinguished because it did not fulfil its expected role as a source of reliable information for the planning, follow-up and assessment of health actions (Souza *et al.*, 2007, p. 853-861). Currently, the Onchocerciasis Programme employs the local HIS. It is notable that no governmental source supplies data on this disease and that the technical presentations of the HM do not include data on the occurrence or monitoring of cases.

The success of the binational (Brazil/Venezuela) control measures against onchocerciasis does not only depend on the drug treatment and follow-up of patients but also on a system of data collection as a source of information for public educational programmes. According to Coelho (Coelho *et al.*, 1997, p. 69-72), several factors explain the lack of an implementation of systematic control measures including the relative isolation of the affected indigenous groups, logistic difficulties, and acute diseases that ravage the area, and thus impose priorities on the action of health teams and/or local agents. Sixteen years after the implantation of the Brazilian Programme for Elimination of Onchocerciasis (Programa Brasileiro de Eliminação da Oncocercose - PBEO) and 10 years after the promulgation of the new model of assistance of indigenous health, the available data on the health/disease profile are still precarious. It is superfluous to emphasise that the availability of data has a paramount importance for planning, executing and assessing services in this and other health programmes. Reliable information is also indispensable for analysing the multiple and complex interrelations among the social inequalities, the health-disease process and ethnicities. Even in the face of the "epidemiologic and demographic invisibility" of the indigenous peoples (Coimbra *et al.*, 2000, p. 125-132), the health indicators point to the higher vulnerability of these groups (Santos *et al.*, 2003, p. 33-55). Importantly, public authorities are aware of the need to enact a health policy specific for the indigenous peoples, which has a paramount importance for broadening the access of Indians to the SUS network.

According to PAHO (2010, p. 1), a meeting was conducted in August 2010 to assess the performance of the PBEO between 2009 and 2010 and to plan the future lines of action, particularly the activities for increasing the collective treatments to strengthen the inter-institutional integration and the Programme sustainability after the creation of the new Secretary.

Upon reflecting on the neglected diseases where the local HIS is used, it is notable that information on the behaviour of an endemic disease allows the identification of individual and collective problems in the sanitary conditions of a population, supplies elements for the analysis of the actual situation and supports the search for possible alternatives, in addition to encompassing actions relative to the health/disease and administrative processes, which are essential for decision making (Branco, 1996, p. 267-270). Although nationwide HISs were created by different mechanisms, the aim in all cases was to meet the needs of central hubs of data to assess the immediate effects of management or to produce health knowledge. Thus, SINAN was created to allow for the performance of a dynamic diagnosis of an event occurrence in the population, which supplies grounds for causal explanations of notifiable diseases, in addition to indicating the risks to which people are exposed, and thus contribute to the identification of the epidemiologic situation of a given geographic area, the SINAN (MS, 2009, p. 148).

Nevertheless, the use of a written instrument for additional data collection, which parallels the professional and administrative records thus duplicating the routine recording of data, is a process common to Brazilian HISs. This duplicated collection and typing of data increases the odds of error and bias in the information produced that is used in the decision-making. However, the use of electronic collectors that bypass the need to perform a digital transcription of the data did not solve this problem because they do not collect the data needed for the processes of work in health; therefore, manual registration is still needed, although it consumes an important fraction of the available human resources. The IT needs of the services themselves are neglected by the central administration cores at the three governmental levels. In addition, the filling of multiple forms or the use of specific data collectors, which are sometimes more than one for a single event, becomes a heavy additional load that does not afford

any support to the improvement of local operations. This modality of data collection often presents no interest to the services but is performed exclusively to comply with administrative regulations, thus resulting in information of poor quality (MS, 2004, p. 230).

The initial actions of the HM targeting the neglected diseases were launched in 2003. Next, the first of a series of workshops devoted to discuss priorities was conducted in 2006. These workshops included the participation of managers, researchers and health professionals. On that occasion, the Programme of Research and Development in Neglected Diseases in Brazil was launched in 2008, which was followed by a thematic call for proposals. The SVS is also a partner in this Programme and provides technical assistance to the priority-defining process and to the assessment of the results of funded research. Based on epidemiological and demographical data and on the impact of the diseases, seven priorities were established among the diseases that were rated neglected by the WHO rather than by the PAHO (dengue, Chagas' disease, leishmaniasis, Hansen's disease, malaria, schistosomiasis and tuberculosis), which comprise the programme for neglected diseases. The aim of those workshops is to orient the public calls for proposals performed by the HM in partnership with the Ministry of Science and Technology, Ministry of Education, state research foundations, state secretaries of health, science and technology and others institutions (DECIT/MS, 2010, p. 200-202).

Three features must be taken into account in the analysis of the perspectives on the control of vector-borne neglected diseases in Brazil, as follows: urbanisation of the population; transformation of the eminently rural characteristic of these diseases concomitant to the urban or peri-urban transformation; and the decentralisation of the actions for the disease control to the level of counties since some of these diseases began to be naturally transmitted in peri-urban or urban areas due to the appearance or reappearance of their vectors in these areas. Together with the decentralisation of the SUS, the execution of actions seeking the control of vectors was incorporated into the health actions of the states and counties. Initially, the recruitment and training of human resources and the supervision and control of the performance of complex field activities, such as the identification and application of anti-vector measures adapted to different local conditions, surpassed the resources of most counties. The association of these factors to budget and financial limitations for keeping hired workers and paying them reasonable salaries resulted in a major challenge to public health in Brazil. For this reason, several models of control were proposed, and many strategies were contested and modified (Tauil, 2006, p. 275-277).

A comparison of the different approaches, conceptions and HIS adopted for the neglected diseases included in the present study allows for the assertion that remarkable advances were achieved after the SUS was decentralised in regard to the improvement of IT in Brazil and the implantation of HIS that made communication among the three governmental spheres viable. However, the experience with each of these diseases shows an on-going inability to comply with the stipulations of the current legislation and to the increasing demands of managers, workers and, in particular, the social control network. There is an urgent need to advance towards the integration of the information systems and in the use of IT to improve the productivity and quality of the processes of work in health, management and social control.

Notably, these improvements are being gradually introduced and are performed on the basis of evidence found in the scientific literature and of an operational nature including the following: a lack of standardisation of the instruments used for data collection and a disagreement among and scarcity of studies on the impact of control actions targeting vectors, when the subjects of interest are vector-borne diseases. Paralleling that development, analytical initiatives using secondary data have been improved and institutionalised. The methodological processes applied to the performance of descriptive analysis, monitoring of health inequalities, analysis of temporal series, special analyses, ecological studies and assessment of impact, among other approaches, benefit from the HIS as a function of the continuity and constant increase of opportunity and representativeness (Brownson, 1999, p. 86-97).

Although SINAN Net is the publicised version of SINAN initiated in 2007, it does not make available all of the categories included in latter, and, in some cases, it does not use the same nomenclature for the included categories, which might confer a confounding bias. Above all, SINAN Net does not make available real-time information, such as the date of updating/insertion of data, which represents a major limitation for the use of this data. For the information in SINAN Net to be effectively used in the monitoring of public health actions and to assess their impact on the control of notifiable diseases, analysis of the quality of the database must be performed on a regular basis to identify and solve the problems of a lack and inconsistency of data and the duplicity of records because only by providing SINAN Net with the appropriate features will the public access to health information be as reliable as to allow local conditions to be placed in a nationwide situational perspective.

Conclusions

The publicised HIS must be rethought for integration not only with the health policies in agreement with the SUS guidelines but also with the original data source system, an observance of the methods for systematic collection and a revision and incorporation of data adapted to local specificities that will make it possible to perform comparisons and prospective assessments of data, in addition to the construction of new indicators emphasising the morbidity and determinants of endemic diseases, and the adoption of analysis units expressing the actual health conditions in the FU. A wider perspective on health surveillance must be based first on the local conditions to then measure the prospective actions for health promotion and disease prevention at the three governmental spheres.