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Inappropriate Drug Donations: What has Happened Since the 1999 WHO Guidelines?

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ABSTRACT

Context: Drug donations to developing countries may be part of medical relief operations in acute emergencies, development aid in non-emergency situations, or a corporate donations programme. After a number of documented inappropriate drug donations, the World Health Organization developed the 'Guidelines for Drug Donations', with the second and final version published in 1999.

Objectives: We reviewed the medical literature on drug donations since the Guidelines publication in 1999.

Design: Literature was retrieved from PubMed and other on-line databases as well as from relevant websites providing medical literature for use in developing countries. We considered the following donations to be inappropriate: (i) essential drugs in excessive quantities; (ii) mixed unused drugs (unsorted medicines and free samples); and (iii) drug dumping (large quantities of useless medicines).

Results: We retrieved 25 publications dated after 1999, including 20 and 5 from the scientific literature and 'grey' literature (technical reports, working papers), respectively. New information concerned emergencies in East Timor, Mozambique, El Salvador, Gujarat State (India), Aceh (Indonesia) and Sri Lanka. Except for East Timor and Gujarat, inappropriate donations still occurred, accounting for 85%, 37%, 70% and 80% of donations in Mozambique, El Salvador, Aceh and Sri Lanka, respectively. Very little information was found on drug donations in non-emergency situations.

Conclusion: There are few recent reports on the compliance of drug donations with the World Health Organization guidelines. For emergency situations, there is still room for improvement. Drug donations in non-emergency situations need to be evaluated. A reform of drug donations policy is needed.

Keywords: Drug donations, in-kind donations, cash donations, drug dumping, emergency, World Health Organization, development aid, humanitarian relief

Background

Drug donations are donations of pharmaceuticals: (i) to less developed countries in acute emergency situations; (ii) in the context of development aid in non-emergency situations; or (iii) as disease-specific drug donation programmes for the control of communicable diseases, also referred to as corporate drug donations (e.g. the Mectizan Donations Programme for the control of river blindness)[1]. Drug donations can be made by corporations, non-governmental organizations (NGOs), governments or individuals. Possible recipients of drug donations include governments, NGOs, health institutions or individual healthcare workers[2].

Although drug donations are mostly well-intended, they can lead to many problems for the recipients if they are not professionally organized. Drug donations that cause more problems than benefits are called inappropriate donations, and entail high transport, storage and destruction costs for the receiving country. Together with the market value of these drugs, this means that millions of US dollars (USD) have been wasted[3].

In 1996, the World Health Organization (WHO) formulated the WHO guidelines for drug donations, in collaboration with over 100 humanitarian organizations[4]. The guidelines were intended to serve as an evidence-based tool to be adopted for good donations practice, as an aid in decision-making, as a reference for national or institutional guidelines and to empower recipients. The need for these guidelines was demonstrated by numerous case reports about inappropriate donations, especially a major report by Berckmans et al.[5] about drug donation practices in Bosnia-Herzegovina during the war between 1992 and 1996.

The WHO received many positive reactions to the first guidelines[6] and introduced some minor changes to the guidelines. Revised guidelines were published in 1999[2]. However, it is unclear if any attention has been given to drug donations by the WHO or other organizations since 1999. This could imply that the problem of inappropriate donations has diminished or disappeared, but we received various signals from healthcare workers in the field (in non-emergency situations) that indicate the opposite. According to a visiting German physician in a major hospital in Cambodia (Doctor J.R. 2010): '*Again I encountered at the medical ward a widespread use of broad spectrum antibiotics, sometimes on quite weak clinical grounds, ceftazidime being currently the no.1! The main reason for this is that it is available due to drug donations and therefore use of it doesn't create costs for the hospital budget. There did not seem to be much awareness for the lack of covering streptococci with that drug*'.

Objectives

Within this context, the objective of the present study was to review the current literature on drug donations since 1999, in order to assess the magnitude of possible inappropriate donations 10 years after the publication of the WHO guidelines. We focussed on drug donations in both emergency and non-emergency situations. We did not include corporate donations programmes since these programmes are targeted to eradicate specific diseases rather than to support a healthcare system as a whole.

Methods

We conducted a literature search according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Statement which is an evidence-based minimum set of items for reporting in systematic reviews and meta-analyses[7] (Figure 1). We used the on-line databases PubMed, Embase, Web of Science, African Index Medicus, African Journals Online and

the African Medical Literature database of the Institute of Tropical Medicine in Antwerp, Belgium. We also searched the internet sites of the major foundations that drew up the first version of the guidelines, which are listed in Figure 1.

Search terms included drug donations, pharmaceutical donations, medical donations, US donations, emergency health kits, in-kind donations and drug dumping. Searches were performed by one author (DvD). Any duplicates were removed. Resulting articles were selected by two authors independently. A first selection was made by screening the abstracts of articles. Secondly, full articles were read to make a final selection. Where there was no consensus, the article was discussed to make a final decision about inclusion. All articles about non-emergency and emergency drug donations published between January 1, 2000 and December 1, 2010 without language restrictions were considered for this review. Articles that only included information on corporate drug donations targeted to a single disease were excluded. We did not include lay press reports.

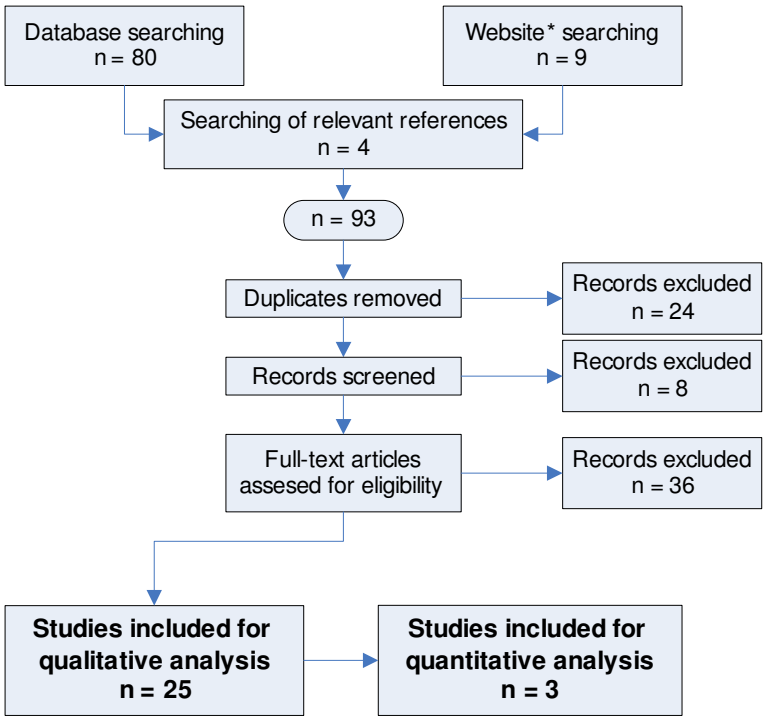
We classified the selected literature into scientific literature (articles published in international professional journals) and grey literature (technical reports, working papers and articles published by interest groups). The scientific literature was divided into PubMed-cited and non-PubMed-cited.

All selected articles were analysed qualitatively (i.e. analysis of general non-numerical data).When a study provided enough information about the total quantity of donations (volume or mass), it was also included for quantitative analysis. In the quantitative analysis of the magnitude of drug donations, we recalculated the amounts of inappropriate donations, measured in metric tons, using the classification of inappropriate donations by Berckmans et al.[5]. Inappropriate donations were divided into three categories, from bad to worse: (i) essential drugs in excessive quantities; (ii) mixed unused drugs; and (iii) drug dumping. The donations in the first category are good quality drugs that are on the essential drug list but donated in too large quantities, overloading the local storage capacity and therefore (when donation management is not done by the donator) entailing huge transportation and destruction costs. Donations in the second category are small, usually non-professional, consignments of unsorted medicines and free samples. The drugs are almost useless for local healthcare workers since usually they are expired or/and non-essential. The final category consists of deliberate or well-intended donations of large quantities of useless medicines. In the case of emergency situations, the total amount of drug donations in kilograms was divided by the number of civilians affected and by the number of years that the emergency period lasted.

Drug donations in emergency and non-emergency situations were considered separately. Emergency drug donations were defined as drugs donated after a natural disaster, during a war period or during a post-war period. Non-emergency drug donations were defined as donations intended to support the local or national healthcare system.

Results

We retrieved 25 publications on drug donations that were published after 1999. Twenty publications were classified as scientific literature (thirteen PubMed-cited and seven non-PubMed-cited) and five were grey literature. A summary is presented in Table 2. Most (17 out of 20) of the scientific publications studied drug donations in emergency situations, only two evaluated drug donations in non-emergency situations and one studied both emergency and non-emergency situations. Further, five publications reported on original research of which three assessed the quantity and/or quality of drug donations, one assessed the influence of drug donations on antibiotic policy and one assessed the financial benefits for donors (Table 2).



*Websites of the following organizations were searched: the World Health Organization; the Association Européenne pour le Développement et la Santé; the World Bank, Oxfam International; Pharmaciens Sans Frontières Comité International; Médecins Sans Frontières; Health Action International; the Partnership for Quality Medical Donations; and the International Committee of the Red Cross.

Figure 1: Literature search and selection process

Table 1: The World Health Organization guidelines on drug donations and practical applications

Practical application	WHO guidelines (short)
Selection of drugs	Donations should be based on the need in the recipient country. Donations should be on the recipient's national or WHO essential drug list. Donated drugs should be similar to the drugs used in the recipient country.
Quality assurance and shelf-life	Donations should comply with the quality standards in both donor and recipient country. No unused returned drugs or professional samples may be donated. Donations should have a remaining shelf-life of one year at arrival in the recipient country.
Presentation, packaging and labelling	Donations should be labelled in a language understood by health professionals in the recipient country. Donations should be packed in large quantity packs. Donations should be packed in accordance with international shipping regulations.
Information and management	Recipients should be informed about all (potential) donations. The value of the donation should be based on the generic equivalent in the recipient country. All costs should be paid in advance by the donor agency.

WHO = World Health Organisation

Table 2: Overview of the literature on drug donations after 1999[4,8-31]

	Author (organization), Year	Type	Topic and Design
Scientific literature (Pubmed-cited)	Quaglio[8], 2000	Discussion paper	Discussion of a drug management programme in post-war Bosnia, 1995 Experiences of application of WHO guidelines on drug donations
	Darder Mayer[9], 2000	Editorial	Evaluation of WHO guidelines and implications for Spain
	Khare[10], 2001	Discussion paper	Core principles of good drug donations
	Snell[11], 2001	Discussion paper	Evaluation of inappropriate donations and WHO guidelines
	Dabade[12], 2004	Discussion paper	Ethical aspects of drug donations
	Ette[13], 2004	Editorial	Effects of expired drugs and importance of shelf-life guideline
	Mariacher[4], 2007	Original research	Experiences of drug donations in non-emergency situations and awareness of WHO guidelines in Tanzania (2001) Questionnaire survey of the public sector, religious sector and NGOs Analysis of Tanzanian drug supply system
	Mariacher[14], 2007	Discussion paper	Results from a questionnaire survey by Mariacher et al. (2007) and options to improve drug donations in Tanzania Interviews with key informers on drug donations
	Howe[15], 2008	Original research	Prescription behaviour in post-Katrina New Orleans and its relevance for drug donation practices Retrospective analysis of hospital charts
	Pinheiro[16], 2008	Discussion paper	Inappropriate donations and good donation practices
	Baker[17], 2009	Discussion paper	Market distortion effects of in-kind drug donations
	Ravishankar[18], 2009	Original research	Assessment of global development assistance for health Yearly volume of all assistance converted to USD, including in-kind donations
	Aloy[19], 2009	Discussion paper	Summary of the arguments against the donation of unused drugs Policy in France for the donation of unused drugs
	Bambarén[20], 2010	Discussion paper	Policies after the 2008 earthquake in Pisco, Peru including drug donation policy and organization
Scientific literature (non Pubmed-cited)	Skrbić[21], 2001	Original research	Effects of drug donations on antibiotic policy in Bosnia-Herzegovina during the post-war period (1994-2000) Retrospective analysis of computer data about antibiotic usage
	Stehmann[22], 2002	Discussion paper	Evaluation of inappropriate donations and relevance for medical students
	Currie[23], 2006	Case report	Clinical case of misuse of donated antibiotics
	Hechmann[24], 2007	Discussion paper	Evaluation of prevention of inappropriate donations
	Xu[25], 2008	Original research	Assessment of quantity and quality of medical donations after the earthquake in Wenchuan, China Assessment of the organization and channelling of drug/medical supply
	Xiao[26], 2010	Original research	Assessment of quantity and quality of drug donations after the earthquake in Wenchuan, China Estimation of the quantity of donations in number of packages
Grey literature	Guilloux (MSF)[27], 2000	Original research	Costs and benefits of drug donations for the donor country Calculation of after-tax gains for donors Financial comparison of drug donations with other models to improve access to medicines
	Autier (AEDES, WHO and World Bank)[28], 2002	Original research	Drug donation practices in several emergency situations Estimation of quantity and quality of drug donations between 1999 and 2001 in East Timor, El Salvador, Mozambique and Gujarat State Comparison with previous research from AEDES (Armenia 1989, Bosnia-Herzegovina 1992-1996)
	Thomas (WOW)[29], 2002	Discussion paper	Negative effects of drug donations for the recipient country and positive effects for the donor country, especially US tax subsidies and charity donations
	(PSF)[30], 2005	Original research	Drug donation practices after the Tsunami in 2004 (Aceh, Indonesia) Questionnaire surveys on the quantity and quality of drug donations
	Fernandopulle (Government of Sri Lanka)[31], 2007	Original research	Drug donation practices after the Tsunami in 2004 (Sri Lanka) Questionnaire surveys and interviews on the quantity and quality of drug donations

AEDES = Association Européenne pour le Développement et la Santé; MSF = Médecins Sans Frontières; NGO = Non-Governmental Organization; PSF-CI = Pharmaciens Sans Frontières Comité International; US = United States; USD = United States Dollar; WOW = War on Want; WHO = World Health Organization.

Most publications reviewed known problems without providing new data. However, some articles offered new insights. *Médecins Sans Frontières* (*MSF*)[27] published a report comparing the costs of drug donations for donor countries, in this case the United States (US), with those of other models that can improve access to essential medicines, such as purchase of generic medicines, concessionary pricing (i.e. selling a small proportion for the full price and donating the rest for free), discounted pricing (i.e. selling drugs at a lower price to developing countries than to industrialized countries) and differential pricing (i.e. selling drugs at a price level that is normal in developing countries). Their conclusions were that the high tax reductions on drug donations can cost the public sector of the donor country over four times more compared to the costs linked to other models that improve access to medicines. Further, the other models support the generic medicine industry and the autonomy of developing countries. The authors also concluded that donor companies in the US have no incentives to lower their drug prices in developing countries, even though the manufacturing costs may allow it.

The charity *War on Want*[29] published a report about US tax reductions on drug donations, emphasizing the tax benefits for US donor corporations that make drug donations or sell drugs at low prices as charity, serving as a potential motive for drug dumping. These tax reductions enable US corporations to dispose of drugs that are no longer profitable, without sustaining major losses. Further, Baker *et al.*[26] explained that in-kind (i.e. non-monetary) drug donations (mostly from pharmaceutical companies) distort competitive pharmaceutical markets, making it difficult for generic producers (e.g. India) and smaller local producers in particular to enter the global and local markets.

Aloy et al.[19] published an article summarizing the downsides of donating mixed unused drugs. The main arguments were costs for the recipient (sorting, storing and destruction costs) and that most donated drugs were not targeted for use in developing countries. Starting in 2009, there was a law in France that prohibits the donations of mixed unused drugs to developing countries.

Two other reviewed publications focussed on specific aspects of drug donations. Škrbi? et al[21]. looked at donations of antibiotics. They concluded that antibiotics were frequently donated and showed that this had a significant influence on doctors' therapeutic choices. A publication by Ette[13] emphasized the importance of the one-year shelf-life guideline (Table 1), because factors such as poor storage conditions in resource-poor settings can have a negative effect on shelf-life, with the therapeutic effect of expired drugs being lower.

Drug Donations in Emergency Situations

The numbers relating to appropriate and inappropriate drug donations in various emergency situations are listed in Table 3. An interesting observation is the variation in the proportion of inappropriate donations in the different emergency situations. In East Timor and Gujarat State, there were very small proportions of inappropriate donations[28]. For East Timor, the reason could be that there were good direct connections by boat and air. In addition, the NGOs mainly donated emergency kits and drugs according to the WHO guidelines. For Gujarat State, the reason could be that most donated drugs were manufactured in India and supplied by the Indian government, while funding mostly came from donors. Since the drugs were manufactured and donated in the same country, there were no problems of labelling, expiry dates and shipment of the drugs.

The proportion of inappropriate donations in the other four countries was much higher. Although the costs of these inappropriate donations cannot be calculated exactly, some indication may be obtained from the figures for Mozambique, where the market value of the inappropriate drugs was estimated at USD 1.2 million[28]. Similarly, the market value of the 'drug dumping' category for El Salvador was estimated at USD 2.8 million. The storage and destruction costs of the inappropriate drugs for Aceh and Sri Lanka

were estimated at over USD 7.0 million and USD 110,000, respectively[30,31]. Overall, there was still a high level of awareness of the WHO guidelines among most donors[28].

The study of Xiao et al.[26] (earthquake, China) did not provide enough data to be analysed quantitatively. However, of interest is that at least 97.32% of all donations came from China itself whereas the authors reported a large proportion of inappropriate donations. They also mentioned financial loss for hospitals and doctors due to donations of excessive amounts of free drugs. This is because the income of hospitals and doctors in China is mostly generated by selling drugs. New insights in a publication by Xu et al.[25] were provided on the same emergency situation. They reported that the government hired a company to organize and monitor the medical supply after the disaster period. They also concluded that there were more drugs (and medical supplies) donated than needed for the emergency situation.

Interesting was that a large proportion of these could be sold to Chinese people outside of the emergency area. The money gained from this was both used for reconstruction purposes and for a national fund for disaster aid. However, 20 tons of drugs, 10 tons of medical devices and 724.54 tons of disinfection materials still needed to be destroyed because they were inappropriate (mostly expired).

Quaglio et al.[8] analyzed experiences of the application of WHO guidelines in post-war Bosnia (1995). Of particular note, they found that local authorities were afraid to lose or no longer receive drug donations, and therefore insisted on donations with few concerns about drug quality. Finally, unique was the publication by Howe et al.[15] which described drug donations in a developed country. The authors studied prescription behaviour in New Orleans (US) after Hurricane Katrina, concluding that many donated drugs did not comply with the needs of a post-disaster situation.

Table 3: Drug donations in emergency situations in East Timor, Mozambique, El Salvador, Gujarat State, Aceh and Sri Lanka

Country	East Timor	Mozambique	El Salvador	Gujarat State (India)	Aceh (Indonesia)	Sri Lanka
Organization, reference	World Bank and AEDES[28]				PSF-CI[30]	Government of Sri Lanka and University of Colombo[31]
Type of disaster	Civil war	Floods	Earthquake	Earthquake	Tsunami	Tsunami
Month/year disaster	1999-2001	2000-2001	Jan and Feb 2001	Jan 2001	Dec 2004	Dec 2004
Population affected	850,000	500,000	1,600,000	1,500,000	2,000,000	600,000
Duration of emergency	1.5 year	1 year	3 months	3 months	6 months	6 months
Estimated drug donations, in tons	545	514	882	1,308	4,000	56
Estimated drug donations per person per year, in kilograms	0.43	1.03	2.20	3.48	4.00	0.19
Estimated appropriate donations, in tons (%)	518 (95)	130 (25)	556 (63)	1,243 (95)	1,200 (30)	11 (20)
Estimated inappropriate donations, in tons (%)	27 (5)	388 (75)	326 (37)	65 (5)	2,800 (70)	45 (80)
Inappropriate donations						
Essential drugs in excessive quantities, in tons (%)	No data	No quantitative data	212 (65) together	0 (0)	No quantitative data	No quantitative data
Mixed unused drugs, in tons (%)		At least 68% together		65 (100)	At least 70% together	28 (50)
Drug dumping, in tons (%)			114 (35)	0 (0)		No quantitative data

AEDES = Association Européenne pour le Développement et la Santé; PSF-CI = Pharmaciens Sans Frontières Comité International.
*Results were adjusted to fit the definition of inappropriate donations by Berckmans et al.[5]

Drug Donations in Non-emergency Situations

Only two studies after 1999 included original research on drug donations in non-emergency situations. Mariacher et al[4]. evaluated the experiences of various recipients (public sector, religious sector, NGOs) by means of a questionnaire study in Tanzania (2001). Table 4 lists the findings for which the WHO guidelines are relevant. They found little difference between the recipient groups. The results show that there was a high proportion of inappropriate donations. An interesting finding is that, in contrast to the emergency situations, the study reported a very low level of awareness of the WHO guidelines among the recipients.

Ravishankar et al.[18] assessed the global development assistance for health from the years 1990 to 2007 converted to USD. Most striking was the large amount of in-kind donations as part of total assistance and its disproportional growth over the last years. For private donations (e.g. from pharmaceutical companies), this part was more than 50% in most years.

Discussion

Our study revealed that there is little literature published on drug donations since 1999. What has been published mainly consists of reports on the results of previous research, with very few papers presenting original research. Original research most often addressed drug donations in emergency situations, with only one study assessing drug donations in non-emergency situations. Original emergency situations research indicated that inappropriate donations are still a major problem, but results vary between emergency situations.

It is unlikely that we have overlooked any relevant literature as the search methods and databases accessed were very broad. Nevertheless it is possible that some literature was missed because it did not match our search terms. Furthermore, it is likely that some technical reports are intended for in-house use and hence not published or distributed in the literature.

Table 4: Drug donations in non-emergency situations in Tanzania: Selected results of a questionnaire study in 2001 by Mariacher et al[4].

	WHO guideline (see table 1)	All recipients (n = 201)*	Public sector (n = 73)*	Religious sector (n = 105)*	NGOs (n = 23)*
Familiar with WHO guidelines	not applicable	30.3%	15.1%	39.1%	39.1%
Percentage of drug supply covered by drug donations	not applicable	26.9%	31.5%	22.9%	17.4%
Received donations they had not asked for	No.1	38.3%	39.7%	41.9%	17.3%
Only drugs on the national essential drug list were donated	No.2	20.4%	23.3%	21.0%	8.7%
Only drugs on the WHO essential drug list were donated	No.2	20.9%	13.7%	26.7%	17.4%
Always received quality certificate with the drug donations	No.4	11.9%	5.5%	16.2%	13.0%
Received mixed unused drugs	No.5	14.9%	13.7%	18.1%	4.3%
Average shelf-life of drug donations was more than one year	No.6	35.8%	23.3%	41.9%	47.8%
Drug donations were always labelled in a local language	No.7	29.4%	38.4%	28.6%	4.4%
Always received invoice documents with the donations	No.9	27.9%	11.0%	38.0%	34.8%
Always informed beforehand about shipment of donations	No.10	29.9%	9.6%	41.9%	39.1%

WHO = World Health Organization; NGO = Non-Governmental Organization.

We did not find any document on drug donations published by the WHO since 1999. Although the WHO created a form to report inappropriate donations in 1999[22], it seems there has been no active follow-up. What is interesting is that the WHO drew up guidelines for equipment donations in 2000, which indicates that there were similar problems with the donation process for medical equipment[32]. Inappropriate equipment donations were reported after the Wechuan earthquake (China, 2008)[25].

Reasons for the low number of publications on drug donations remain unclear. A possible explanation is that the positive evaluation by the WHO of the first version of their guidelines created the illusion that the problem of inappropriate donations had been solved[6]. Other reasons for the lack of publications include the low quality of administrative systems in most countries receiving drug donations, and the chaos during emergency situations[14,28,31]. Furthermore, the first priority during emergency situations is to give support and assistance, not to analyze the progress of drug donations. This means that analysis is mostly done after the emergency, when a lot of important information is no longer available[5]. An exception however is the Wechuan earthquake, were the drug supply was well-monitored during the emergency situation by a private corporation hired by the government[25].
The low quality of administrative systems and poor accessibility of health institutions in developing countries make it difficult to perform sound research on the quality and quantity of appropriate and inappropriate drug donations. This is illustrated by the low level of response (30%) and high percentage of 'I don't know' and 'no answer' replies in the questionnaire used by Mariacher et al.[4] in their survey on drug donations in non-emergency situations in Tanzania.

Although there is a lot of overlap between problems in emergency and non-emergency situations, there are also differences. In non-emergency situations, problems in communication arise as most important, whereas in emergency situations, drug quality is of most concern (e.g. short shelf-life, incorrect labelling)[4,28].

We found that in emergency situations, the appropriateness of drug donations depends very much on the specific situation. During the acute emergency, countries rely more on buffer stocks than on drug donations. If these buffer stocks are not available or have been destroyed, countries become dependent on drug donations (as was the case for Mozambique in 2000-2001)[28]. Cash donations, close ties with the developed countries and a high national drug manufacturing capacity improve drug donations, as was seen in the case of Gujarat State and East Timor[28]. However, the case of Wechuan illustrates that donations from within the country can also be inappropriate[26]. Finally, it is worth noting that inappropriate drug donations are not only a problem in developing countries, as is shown by the case of New Orleans (US, 2005)[15].

There were no data allowing comparison of the magnitude of drug donations in non-emergency situations versus emergency situations. However, the prevalence of problems in the drug donations process in non-emergency situations indicates that they were also characterized by a large proportion of inappropriate donations. It is interesting to see that awareness of the WHO guidelines was very low in non-emergency situations, unlike what was found in emergency situations[4].

This is striking because the amount of non-emergency drug donations is expected to be larger in terms of volume and impact than emergency drug donations. Whereas emergency drug donations are limited in time and space, non-emergency drug donations may be part of the regular pharmaceutical supply. They have unwanted consequences and the desirability of this dependency is questionable of course. Drug donations could possibly influence therapeutic choices[27] and also hinder regular income flow that would normally be obtained from selling drugs (patients normally do not have to pay for donated drugs)[19]. Therefore, drug donations in non-emergency situations could limit the development of a sustainable healthcare system.

The finding that cash donations are more effective than in-kind donations is interesting because cash donations are also more than four times cheaper for the public sector in the donor country than in-kind donations[27,29]. Thus, the parties benefitting most from in-kind donations instead of cash donations are pharmaceutical corporations, due to after-tax gains. This raises questions about the need for more appropriate drug donations or for a reform of the model used for the drug donations process. Yet a large and growing proportion of drug donations are in-kind[18].

In conclusion, there are too few publications to draw hard conclusions on the current state of drug donations and on the use of the WHO guidelines. However, the available publications indicate that the drug donation process has not improved enough after the introduction of the guidelines. In view of this, drug donations and the use of WHO guidelines should be further evaluated, especially in non-emergency situations. The WHO, governments, NGOs, pharmaceutical companies and other major organizations/donors should collaborate to stimulate appropriate drug donation policies that will, in fact, benefit the targeted recipient populations.

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