

**Allocation of Antiretroviral Drugs to HIV-infected Patients in Togo: Perspectives of
People Living with HIV and Healthcare Providers**

To cite this article:

Kpanake, L., Sorum, P. C., & Mullet, E. (2017). Allocation of antiretroviral drugs to HIV-infected patients in Togo: perspectives of people living with HIV and healthcare providers. *Journal of Medical Ethics*, 43,845-851.

ABSTRACT

Aim: To explore the way people living with HIV and healthcare providers in Togo judge the priority of HIV-infected patients regarding the allocation of antiretroviral drugs.

Method: From June to September 2015, 200 adults living with HIV and 121 healthcare providers living in Togo were recruited for the study. They were presented with stories of a few lines depicting the situation of an HIV-infected patient and were instructed to judge the extent to which the patient should be given priority for antiretroviral drugs. The stories were composed by systematically varying the levels of four factors: (a) the severity of HIV infection, (b) the financial situation of the patient, (c) the patient's family responsibilities and (d) the time elapsed since the first consultation.

Results: Five clusters were identified: 65% of the participants expressed the view that patients who are poor and severely sick should be treated as a priority, 13% prioritised treatment of patients who are poor and parents of small children, 12% expressed the view that the poor should be treated as a priority, 4% preferred that the sickest be treated as a priority and 6% wanted all patients to get treatment.

Conclusion: The WHO's guideline regarding ART allocation (the sickest first as the sole criterion) currently in use in many African countries does not reflect the preferences of Togolese people living with HIV. For most HIV-infected patients in Togo, patients who cannot get treatment on their own should be treated as a priority.

Keywords: health care rationing; antiretroviral therapy; public opinion; empirical research; Togo

INTRODUCTION

HIV infection is undertreated in Africa. Of the 21.2 million people eligible for antiretroviral therapy (ART) in December 2013 under the 2013 WHO guidelines¹--which call for starting treatment at a CD4 count of 350 cells/mm³--only 37% were receiving HIV treatment as of December 2013.² It is no coincidence that 790 000 people in Africa died from HIV-related causes in 2014, accounting for 70% of AIDS-related deaths worldwide.³ Rationing of ART is thus already occurring in Africa,^{4,5} and the 2016 WHO recommendation to start treatment in "all adults living with HIV, regardless of WHO clinical stage and at any CD4 cell count" (ref.⁶ p. xxxi) would dramatically increase the number of eligible patients and intensify the need for rationing. Accordingly, Rosen et al. (ref.⁴, p. e303) stated: "there is almost no chance that African countries will have the human, infrastructural, or financial resources to treat everyone who is in need." The large mismatch between ART supply and demand and the life-and-death nature of AIDS treatment raise difficult ethical questions. Which patients should receive ART first, and which others should wait? What criteria ought to be used for the allocation of ART? How should allocation criteria be weighted?

Principles for the allocation of scarce medical interventions

Prioritising patients for scarce medical interventions is always grounded in value-based judgments.⁷ Persad, Wertheimer and Emanuel⁷ have categorised those values into four types: (a) treating people equally; (b) favouring the worst-off; (c) maximising total benefits and (d) promoting and rewarding social usefulness.⁷

Treating people equally: For many scarce medical resources, benefiting patients equally entails providing equal chances at those resources. A random process is simplest

and most resistant to corruption, but it disregards relevant factors such as the number of years already lived. The principle of first-come, first-served is frequently used in medicine and is recommended by some commentators for the allocation of intensive care beds⁸ and organs⁹, but it not only disregards relevant factors like age but is open to the influence of morally non-relevant factors, such as wealth, that enable some patients to be first in line.

Favouring the worst-off prioritises patients in great need. Three versions of this are seen. The first is the sickest first criterion, which gives priority to patients with the worst prospects if left untreated. It is commonly used in clinical medicine, e.g. in the emergency department, when deciding whom to treat next. It may, however, result in giving too much attention to patients who look sick now at the expense of those with more severe underlying illnesses⁷. The second version is the youngest criterion, in which treatment is provided preferentially to those patients who have benefitted from less life⁷. This criterion may also neglect other relevant factors. The third version of worst-off (not discussed by Persad, et al.⁷) is to favour the poorest members of society, patients who have no way to get treatment on their own. In societies in which the rich can obtain medications outside the official allocation program, as in many African countries^{4,10,19}, this version of the worst-off criterion is often used to allocate scarce treatments.^{4,10}

Promoting and rewarding social usefulness prioritises specific patients to enable them to fulfill important social functions or to reward them for doing this.⁷ For instance, when dialysis was first introduced in the United States, social usefulness was a key consideration in allocating scarce dialysis machines: patients who were heads of families received priority over those who did not have dependents.¹¹ The identification of certain

people, functions and values as more important than others may, of course, be problematic.

Maximising total benefits: In the spirit of utilitarianism, maximising strategies might involve saving the most lives or life years⁷ or producing the most quality-adjusted or disability-adjusted life years. The choice of younger patients might be, accordingly, motivated less by a policy of favouring the worst-off and more by one of maximising benefit, i.e. future life years¹²⁻¹³.

A policy might, of course, incorporate more than one criterion. Notably, the WHO declares that, in principle, all patients infected with HIV should receive ART, but realises that, in practice, allocation decisions have to be made. WHO appears at first to be using the worst-off criterion: "As a priority, ART should be initiated in all adults with severe or advanced HIV clinical disease (WHO clinical stage 3 or 4) and adults with a CD4 count ≤ 350 cells/mm³." It points out, however, in support of this guideline, that studies have found that those with low CD4 counts benefit more from ART than do those with higher counts. Thus, WHO actually appeals to the criterion of maximising total benefits. It does not specify, however, how to choose among those patients who fall below the cutoff values, implying that supply will then be sufficient.

While substantial ethical analyses highlight morally relevant factors that might guide allocation of scarce medical interventions⁷, very little is known about how people directly affected by ART rationing decisions--i.e. HIV-infected patients--think those drugs should be allocated. This knowledge is, however, important as it could better inform the public debate about ART rationing policies.

Very few studies have addressed the issue of lay people's views regarding ART allocation. Nann and colleagues¹⁴ examined how HIV-infected patients and healthcare providers in Cambodia think ART should be allocated. Participants were presented with 48 vignettes that varied in terms of the severity of infection, the patient's family responsibilities, the financial situation of the patient's family, and the time elapsed since the first consultation. They found a diversity of opinions on the issue, with groups of participants focusing on different sets of factors: 37% gave high consideration to the family's financial situation, the family responsibility and the severity of infection; 31% only to the severity of infection; 29% to the financial sustainability of the patient's family and whether patients were responsible for young children; and 3% to family responsibility and the waiting time. Most respondents expressed the view that patients with considerable social needs, i.e., parents of small children and/or those already in a precarious financial situation, should be given priority. Healthcare providers were mainly in the cluster that emphasises the severity of infection while HIV-infected patients were mainly in the clusters that emphasise financial situation.

In Great Britain, Furnham, Ariffin and McClelland¹³ asked a sample of the general public to act as though they had to make decision in terms of priority of treatment for HIV-infected patients depicted in 16 vignettes. The vignettes were all combinations of four dichotomous features: younger vs older, male vs female, heterosexual vs homosexual and monogamous vs sexually promiscuous. The participants were most influenced by sexual orientation and activity and favoured patients who were younger, were heterosexual and were monogamous. Religious participants strongly favoured young, straight patients more than did less religious participants.

In the United States, Green, Fong, Mauger and Ubel¹⁵ explored the views of HIV-infected patients and the general public regarding ART rationing policies and found that 73% disagreed with a first-come first-served policy, 72% disagreed with a sickest-first allocation system and 53% disagreed with policies that provided treatment to some but not all patients. HIV-infected patients more strongly disagreed with those policies than did the public.

Unfortunately, little attention has been paid to lay people's views on the issue in African countries, although the extreme scarcity of antiretroviral drugs on this continent and the context of great poverty among its populations make ART rationing issues more challenging and different from what has been described on other continents.^{4,5}

The present study

The purpose of the present study is to examine how HIV-infected patients and healthcare providers in Togo think antiretroviral agents should be allocated. Togo is a western African country with a population of 7.3 million.¹⁶ In Togo, HIV prevalence is 2.5%, and AIDS remains the most common cause of death, accounting for 17% of all deaths.¹⁷ Antiretroviral treatment for HIV has been provided for free in Togo's official allocation program since 2008 and 49.3% of HIV-infected patients were receiving ART in 2012.¹⁸ The rationing policy for ART in such a public program has strictly followed the WHO's guidelines--that is, only medical considerations are used to make allocation decisions.¹⁸ Healthcare providers inform their HIV-infected patients about this allocation criterion during follow-up consultations. Some rich patients have obtained their ART outside the official allocation program, via private providers, at US\$ 160 per month,¹⁹ which is far above the median monthly income in Togo (US\$ 47 in 2015)²⁰.

The methodology used here was similar to that used in several other studies investigating lay people's views on rationing scarce medical resources,¹²⁻¹⁴ in that realistic vignettes depicting patients' situations were presented to participants who were instructed to rate them on a priority scale. The validity of this method for examining medical preference issues was supported by Ulrich and Radcliffe²¹ and by Froberg and Kane.²² According to Ulrich and Radcliffe²¹, the vignette technique makes it possible to assess how cues are weighted, how they are combined and how different groups of participants differ in weighting and combining. One condition for examining the processes of weighting and combining, independently of other processes, is that each participant has the same information presented in the same way. This methodology has been successfully implemented in previous studies of African lay people's views on several ethical issues, namely physician-assisted suicide,²³ criminalisation of HIV infection,²⁴ and breaking bad news to patients²⁵. In the present study, the vignettes depicted the situation of an HIV-infected patient in need of antiretroviral drugs. They were composed of the four criteria commonly found in the literature on lay people's views on rationing that were most relevant to the situation in Togo^{10,12,14}: (a) the severity of the infection; (b) the patient's family responsibility; (c) the time elapsed since the first consultation; and (d) the patient's financial situation. Participants were asked to assess the extent to which the patient described in each vignette should be given priority in the allocation of ART.

Our first hypothesis, based on previous studies¹²⁻¹⁴, was that when prioritising HIV-infected patients for ART, most people's judgments are influenced by factors included in the vignettes. Our second hypothesis, based on the findings of Nann et al.¹⁴

and previous studies on African people's views about ethical issues,²³⁻²⁵ was that people have diverse views about which allocation factors are more important when giving access to ART. Our third hypothesis, based on the findings of Kafiriri and Martin¹⁰ and Nann et al.,¹⁴ was that, when judging treatment priority for HIV-infected patients, most people combine multiple allocation factors--i.e. social, financial and medical considerations--rather than focus on the single medical factor, as recommended by WHO⁶. Our fourth hypothesis was that, among allocation factors considered for this study, the most important to people would be the patient's financial difficulties. This hypothesis is based on findings from previous studies from developing countries,^{10,14} and on the social justice agenda pursued by some African governments which favors the poorest members of society, those who cannot afford treatment on their own.^{4,10}

METHODS

Participants

The 321 participants were either HIV-infected patients attending HIV/AIDS centres in Lomé or members of the clinical staff. The centres offer free medical care and various other services (e.g. counselling and social support) to people living with HIV. From June to September 2015, five trained research assistants approached 302 consecutive HIV-infected patients seeking routine services in these centres. They also contacted 200 health caregivers working in these centres. After receiving full explanations of the study and its procedures, 200 HIV-infected patients (119 women and 81 men, aged 18 – 65 years) and 121 healthcare providers (28 physicians, 27 medical assistants, 27 nurses, and 39 nurse's assistants) agreed to participate. The participants were unpaid volunteers. See Table 1 for

more details about their demographic characteristics. Although most HIV-infected patients in Togo are female and under 40 years of age,¹⁸ as reflected in this study's sample, no reliable statistics were, however, available for precisely assessing the extent to which the sample was biased for all the demographic characteristics considered for this study. Previous studies on peoples' views regarding ethical issues^{14,21,24,25} have, however, shown that the recruitment technique used for this study is an efficient means of revealing the different possible positions.

INSERT TABLE 1 HERE

Material

For the sake of comparison, the material used in the present study was exactly the same as that used in Cambodia by Nann and colleagues¹⁴. It could be used without changes because it was well adapted to the current situation in Togo and was understood by all participants. It consisted of 48 cards containing a story of a few lines, a question and a response scale. The stories were composed by systematically varying the levels of four factors: (a) the severity of HIV infection (moderate: CD4 count >200 cells per mm³; severe: CD4 between 50 and 200; or very severe: CD4 <50); (b) the patient's family responsibilities (young mother, aged about 35, with four young children; young father, aged about 35, with four young children; young man, aged about 35, without children; or older father, aged about 65, with adult children); (c) the time elapsed since the first consultation (two months vs. one year); and (d) the financial situation of the patient's family (can sustain itself vs. cannot sustain itself), 3 × 4 × 2 × 2. The question under each vignette was, "To what extent do you think that [patient's name] should be given priority in the allocation of treatment?" The response scale was an 11-point scale with

anchors of “Not at all a priority” (0) and “Extremely high priority” (10). The cards were arranged by chance and in a different order for each participant. The material was in French, the official language in Togo. Two examples of scenarios are given in Appendix A. See online supplementary Table 1 for the whole set of scenarios.

A scale was used--rather than, for example asking the participants to allocate a limited set of tokens among the patients--because the aim of the present study was not to derive a numerical ranking of each of the scenarios, but to make quantitative inferences from participants’ responses about what factors were most important to them and in what way they combined the information from multiple factors.

Procedure

The site for the experiment was a quiet room in the HIV/AIDS centres. Each person gave his or her informed consent and was tested individually by the research assistants. As recommended by Anderson,²⁶ the sessions had two phases. In the familiarisation phase, the assistant researcher explained to each participant what was expected: that he or she was to read a certain number of stories in which a person living with HIV is in need of treatment and was to indicate, in each case, the degree of priority attributed to the patient. Next, each participant was presented with 24 stories randomly taken from the complete set. The participant read each story out loud, after which the assistant reminded him or her of the items of information the story contained. The participant then provided priority ratings. After completing the 24 ratings, the participant was allowed to compare responses and change them. In the experimental phase, the whole set of 48 stories was presented. Each participant provided ratings at his or her own pace, but was no longer

allowed to compare responses, nor to go back and make changes as in the familiarisation phase.

The participants took 30-45 minutes to complete both phases. The experimental phase went quickly because they were already familiar with the task and the material.

Ethics approval for the study was obtained from the Institutional Review Board of University of Québec-Teluq. Full anonymity was provided to all participants.

Statistical analyses

For each of the 48 scenarios, each mark along the response scale was converted into a numerical rating ranging from 0 to 10. As expected, we detected strong individual differences in responses during data gathering. Accordingly, we performed cluster analysis on the raw data using the K-means method, as recommended by Hofmans and Mullet.²⁷ Several solutions were tested: two, three, four, five, six and seven clusters. Finally, we performed Chi² tests to examine the effects of demographic characteristics.

RESULTS

The participants' mean ratings for the scenarios ranged from 1.17 to 9.72 (overall mean = 5.59). The five-cluster solution was retained because it was the one that produced the most interpretable findings. Further testing using the elbow technique--a technique similar in spirit to the scree test in factor analysis--supported the validity of this choice.²⁸ The patterns of data that correspond to the first four clusters are shown in Figures 1 and 2, and the distribution of participants in each cluster is shown in Table 1.

INSERT FIGURE 1 HERE

INSERT FIGURE 2 HERE

The first cluster ($N = 13$, 4%) was termed *Infection* since the factor that had the greatest impact on priority ratings was the severity of infection. The lower the CD4 count, the higher the priority (means of 9.29, 6.03, and 0.80 for levels of <50, 50-200, and >200, respectively). The other factors had only a very weak impact on the ratings.

The second cluster ($N = 37$, 12%) was termed *Financial situation* since the factor that had the greatest impact on the priority ratings was the financial sustainability of the family. The lower the family's income, the higher the priority (means of 9.17, and 0.81 for levels of 'does not have enough income to keep everyone alive', and 'enough income', respectively). The other factors had only a very weak impact on the ratings.

The third cluster ($N = 41$, 13%) was termed *Social situation and Infection*. As in the first cluster, the severity of infection had an impact on the priority ratings. Patients with a very low CD4 count were given greater priority ($M = 8.27$) than patients with a moderately low CD4 count ($M = 5.56$) and with a higher count ($M = 2.88$). As in the second cluster, the sustainability of the family had an impact on the priority ratings. Patients from poor families were given greater priority ($M = 6.65$) than patients from sustainable families ($M = 4.49$). In addition, the family situation factor had an impact on ratings: the older father was considered as having slightly less priority than the other patients. The four means were 3.90 (older father of adult children), 5.71 (young male without children), 6.25 (young mother of four), and 6.42 (young father of four). Also, the three factors interacted in a complex way. In the case of a very poor family, the infection factor had its strongest effect when the patient was old. In the case of a sustainable family, the infection factor had its strongest effect when the patient was young.

The fourth cluster (N = 209, 65%) was termed *Financial situation and Infection* since both factors had strong impacts on the priority judgments. This cluster was by far the largest. As in the third cluster, patients with a very low CD4 count were given greater priority (M= 7.00) than patients with a moderately low CD4 count (M=5.63) and with a higher count (M=4.32). Also, patients from poor families were given greater priority (M= 8.30) than patients from sustainable families (M=3.00). Contrary to what was found in the third cluster, however, the family situation factor had no effect on ratings. In addition, the infection factor had a weaker effect in the case of a very poor family ($9.30 - 7.32 = 1.98$) than in the case of a sustainable family ($4.71 - 1.31 = 3.40$).

The fifth cluster (N = 20, 6%) was termed *Treatment in all cases* because the ratings were high in all cases (overall mean = 7.93). The infection factor had a slight effect ($8.76 - 7.16 = 1.60$). This cluster is not shown in Figure 1.

As shown in Table 1, the composition of the clusters differed significantly as a function of the participants' groups. Physicians are more frequent (86%) in the Social situation and Infection cluster than patients (2%), nurse's assistants (8%), medical assistants (15%) and nurses (22%). Thus, most of them applied a complex judgment process integrating information about income, family responsibilities, and severity of infection. Only one of the physicians based his or her priority judgment solely on severity of infection, as recommended by the WHO⁶. Most patients (80%), nurses (56%) and medical assistants (52%) based their priority judgments on the patient's financial situation and severity of infection, while only 11% of physicians did so. The medical assistants and nurse's assistants were most likely to conform strictly to the WHO recommendations.

DISCUSSION

While rationing of ART is inevitable in Africa, this study is the first to examine how HIV-infected patients and healthcare providers in an African country think antiretroviral agents should be allocated.

The first hypothesis was that, when prioritising HIV-infected patients for ART, most people's judgments are influenced by factors included in the vignettes. The data supported this hypothesis: the participants' priority judgments were influenced by the financial situation of the patient, the severity of HIV infection, the patient's family responsibilities and the time elapsed since the first consultation. Patients in the scenarios, who were parents of young children, poor, severely sick, and waiting for a long time received priority over those who had adult children or no children, were wealthy, were not severely sick, and had been put on the waiting list more recently. This finding was consistent with that of Nann and colleagues¹⁴ in Cambodia and Stahl and colleagues¹² in the United States; and suggests that lay people are sensitive to medical as well as social factors involved in patients' situations, when giving access to scarce life-saving treatments.

The second hypothesis--that several qualitatively different positions about which allocation factors are more important would be found—was supported by the results. Five positions were identified: in order of frequency, "Financial situation and Infection", "Social situation and Infection", "Financial situation", "Treatment in all cases", and "Infection". This supports the findings of Nann et al.¹⁴ in Cambodia and suggests that

people vary considerably in the way they weight and combine allocation factors--when giving access to ART.

The third hypothesis--that, when prioritising patients for ART, most people combine multiple allocation factors, rather than considering one alone--was also supported by the data. Seventy-eight per cent of participants combined more than one allocation factors in determining a patient's priority. They took into account severity of infection--WHO's sole allocation criterion--as well as social considerations (patient's financial sustainability and family responsibilities). Thus, in the view of the large majority of participants, no allocation criterion is sufficient on its own to make a fair allocation.

The fourth hypothesis--that the most important criterion for people would be the patient's financial sustainability--was also supported by the results. The two factors with the greatest impact were the patient's financial situation and the severity of infection. The participants integrated these factors such that patients who were financially sustainable were never given a high rating, irrespective of infection severity. A patient was given priority only when, in addition to being severely sick, he or she was poor--that is, had no way to get treatment on his or her own. While treatment denial on grounds of the patient's ability to pay may appear striking and controversial, this consideration is not uncommon within health care in many African countries,^{4,26} and may appeal to participants' sense of equity--a need to protect the most vulnerable. As Kapiriri and Martin²⁶ reported from Uganda, "when drugs are limited, patients who can afford them are denied free drugs so as to benefit those who cannot afford to buy them."

Yet patients did not insist solely on social criteria, nor healthcare providers on medical ones. Instead, most patients (82%) and healthcare providers (74%) utilized both medical and social criteria in judging priority. Furthermore, even though most patients (80%) were in the Financial situation and Infection cluster and most physicians (86%) in the Social situation and Infection one--suggesting that patients may be more sensitive to a patient's financial situation and physicians to his or her family situation--the difference in meaning between the two clusters is not great. Accordingly, a consensus among patients, physicians and other healthcare providers might not be difficult to reach if health authorities, patients and the public in Togo chose to work together to agree on a policy for allocating antiretroviral drugs.

Participants gave the least consideration to the first-come first-served principle when making their allocation decisions. This supports previous findings from studies on rationing antiretroviral treatment.^{14,15} Although the first-come first-served principle appears to promote fair equality of opportunity, it is frequently rejected as morally unjustifiable. According to Persad et al.,⁷ for example, this principle ignores relevant individual differences and even fails to treat people equally, as it favours people who are well-off and is susceptible to corruption. In Malawi, for example, HIV-infected patients with political, social, and economic influence are "involved in a high degree of queue jumping" to receive antiretroviral drugs. (ref. ²⁹ p.47)

In the present study, despite being told to assume that a rationing decision was necessary, a small group of respondents (6%) did not take into account the information in the scenarios and expressed the view that all patients should get treatment. This raises the question of whether they understood the task at hand or simply disagreed with the

practice of ART rationing. Rejecting ART rationing was in any case, the position one respondent communicated to us: "La justice n'est pas de décider qui doit mourir mais de rendre les traitements accessibles en Afrique" [Justice is not to decide who should die but to make treatment accessible in Africa]. This position may appear extreme, but it is supported by Médecins Sans Frontières, which considers the practice of ART rationing as fundamentally unethical because it conflicts with the ideal of universal access to treatment and the human right to health.³⁰

This study has some limitations. First, this study utilized a sample of only moderate size, restricted to participants living in one precise area. Second, many other factors not investigated in this study can potentially influence HIV-infected patients' and healthcare providers' views regarding ART allocation. Any generalization of the findings must, therefore, be done with care. Third, the experimenter did not ask further questions to the respondents to elucidate the reasons underlying their viewpoints. Future follow-up studies using qualitative methods are needed to understand the respondents' justifications.

Despite these limitations, this is the first study that can help to inform policymakers in Togo about the views of those directly affected by ART rationing decisions. These people's views are particularly important in the ongoing efforts of Togolese government to reach agreement about how to balance competing morally relevant values in setting up a fair ART rationing system.

References

1. UNAIDS. Access to antiretroviral therapy in Africa: status report on progress towards the 2015 targets. Geneva : UNAIDS, 2013.
2. UNAIDS. 90-90-90 An ambitious treatment target to help end the AIDS epidemic. Geneva: UNAIDS, 2014. Available at <http://www.unaids.org/en/resources/documents/2014/90-90-90> (accessed 2 Oct 2016).
3. WHO. Global health observatory (GHO) data : number of deaths due to HIV/AIDS. Geneva : WHO, 2016. Available at http://www.who.int/gho/hiv/epidemic_status/deaths_text/en/ (accessed 31 Aug 2016).
4. Rosen S, Sanne I, Collier A, *et al.* Rationing antiretroviral therapy for HIV/AIDS in Africa: choices and consequences. *PLOS Med* 2005;2:11 e303.
5. Rosen S, Sanne I, Collier A, *et al.* Hard choices: rationing antiretroviral therapy for HIV/AIDS in Africa. *Lancet* 2005;365:354-6.
6. World Health Organization. Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection: recommendations for a public health approach – second edition 2016. Geneva: World Health Organization, 2016. Available at http://apps.who.int/iris/bitstream/10665/208825/1/9789241549684_eng.pdf (accessed 31 Aug 2016).
7. Persad G, Wertheimer A, Emanuel EJ. Principles for allocation of scarce medical interventions *Lancet* 2009;373:423–31.

8. American Thoracic Society Bioethics Task Force. Fair allocation of intensive care unit resources. *Am J Respir Crit Care Med* 1997;156:1282-301.
9. Childress JF. Putting patients first in organ allocation: an ethical analysis of the US debate. *Cam Q Healthc Ethics* 2001;10:365-76.
10. Kafiriri L, Martin DK. Bedside rationing by health practitioners : a case study in a Ugandan hospital. *Med Decis Making* 2007;27:44-52.
11. Sanders D, Dukeminier J. Medical advance and legal lag : hemodialysis and kidney transplantation. *UCLA Law Rev* 1968;15 :357-419.
12. Stahl JE, Tramontano AC, Swan JS et al. Balancing urgency, age and quality of life in organ allocation decisions-what would you do?: a survey. *J Med Ethics* 2008;34:109-15
13. Furnham A, Ariffin A, McClelland A. Factors affecting allocation of scarce medical conditions. *J Appl Soc Psychol* 2007;37:2903-21.
14. Nann S, Dousset J-P, Sok C, et al. Cambodian patients' and health professionals' views regarding the allocation of antiretroviral drugs. *Dev World Bioeth* 2012;12:96-103.
15. Green MJ, Fong S, Mauger DT, et al. Rationing HIV medications: what do patients and the public think about allocation policies. *J Acquir Immune Defic Syndr* 2001;26:56-62.
16. WHO. Country statistics and global health estimates: Togo. Geneva: WHO, 2015.
17. Conseil National de Lutte contre le SIDA et les Infections Sexuellement Transmissibles – Togo. Rapport d'activité sur la riposte au VIH/SIDA au Togo, 2015.

- http://www.unaids.org/sites/default/files/country/documents/TGO_narrative_report_2015.pdf (accessed 12 Aug 2016)
18. Programme National de Lutte Contre le Sida et les IST – Togo : Rapport annuel des activités - année 2012
 19. Deleuze A-S. «Chic, Choc, Chèque» : les comportements sexuels à risque des étudiantes universitaires de Lomé (Togo). Mémoire de Maîtrise, Université Laval, 2011.
 20. World Bank. World development indicators 2015: Togo. Washington, DC, USA. Available at <http://data.worldbank.org/country/togo>; accessed February 15, 2017.
 21. Ulrich CM, Ratcliffe SJ. Hypothetical vignettes in empirical bioethics research (161-81). In, *Empirical methods for bioethics: a primer*. L. Jacoby, LA Siminoff, eds. San Diego, CA : Elsevier, 2008.
 22. Froberg DG, Kane RL. Methodology for measuring health-state preferences-IV : Progress and a research agenda. *J Clin Epidemiol* 1989;42:675-85.
 23. Kpanake L, Dassa SK, Sorum PC, *et al.* Togolese lay people’s and health professionals’ views about the acceptability of physician-assisted suicide. *J Med Ethics* 2014;40:621-4.
 24. Kpanake L, Patassi A, Mullet E. Criminal prosecution of a male partner for sexual transmission of infectious diseases: The views of educated people living in Togo. *Sex Transm Infect* 2013;89:290–4.
 25. Kpanake L, Sorum PC, Mullet E. Breaking bad news to Togolese patients. *Health Commun* 2016;31:1311-7.
 26. Anderson NH. *Unified social cognition*. New York, NY: Psychology Press; 2008.

27. Hofmans J, Mullet E. Towards unveiling individual differences in different stages of information processing: a clustering-based approach. *Qual Quant* 2013;47:555-64.
28. Schepers J, Hofmans J. TwoMP: A MATLAB graphical user interface for two-mode partitioning. *Behav Res Methods* 2009;41:507-14.
29. Jimmy-Gama D, Gibson S, McPake B et al. Antiretroviral therapy (ART) rationing and access mechanisms and their impact on youth ART utilization in Malawi. *Malawi Med J* 2011;23:47-53.
30. Rennie S. Is it ethical to study what ought not to happen? *Dev World Bioeth* 2006;6:71-7.

Appendix A:

Two examples of scenarios

Mrs. Akakpo is 35 years old. She is the mother of four young children. She is infected with the AIDS virus.

She has been coming for about a year to the medical dispensary of the suburb north of Lomé where drugs against HIV are free.

Her severity of infection is now very high (CD4 <50).

Mrs. Akakpo lives in difficult financial conditions that do not much favor the continuation of treatment. Her family does not have enough income to keep everyone alive.

Unfortunately, the medical dispensary does not have enough drugs to treat all the HIV-infected patients.

To what extent do you think that Mrs. Akakpo should be given priority in the allocation of treatment?

Not at all a priority o---o---o---o---o---o---o---o---o---o Extremely high priority

Mr. Mazabalo is 65 years old. He is the father of four adult children. He is infected with the AIDS virus.

He has been coming for about two months to the medical dispensary of the suburb north of Lomé where drugs against HIV are free.

His severity of infection is now moderate (CD4 >200).

Mr. Mazabalo lives in financial conditions that favor the continuation of treatment. His family has enough income to keep everyone alive.

Unfortunately, the medical dispensary does not have enough drugs to treat all the HIV-infected patients.

To what extent do you think that Mr. Mazabalo should be given priority in the allocation of treatment?

Not at all a priority o---o---o---o---o---o---o---o---o---o Extremely high priority

Table 1. Demographic Characteristics of the Sample and of Each Cluster.

Characteristic	Clusters					Total
	Infection	Financial situation	Social situation and Infection	Financial situation and Infection	Treatment in all cases	
Gender : $\text{Chi}^2(4) = 0.61, p=.96$						
Female	7 (4)	24 (12)	24 (12)	126 (66)	11 (6)	192
Male	6 (5)	14 (11)	17 (13)	83 (64)	9 (7)	129
Age : $\text{Chi}^2(12) = 18.82, p=.09$						
18-35 Years	8 (9)	8 (9)	8 (9)	58 (67)	5 (6)	87
36-40 Years	2 (2)	8 (10)	7 (8)	59 (70)	8 (10)	84
41-50 Years	3 (3)	14 (15)	18 (19)	56 (59)	4 (4)	95
51+	0 (0)	8 (15)	8 (15)	36 (65)	3 (5)	55
Religion : $\text{Chi}^2(16) = 23.18, p = .11$						
Christians	7 (4)	24 (14)	19 (11)	112 (65)	11 (6)	173
Muslims	2 (3)	9 (12)	9 (12)	55 (71)	3 (4)	78
Animists	2 (8)	2 (8)	5 (21)	12 (50)	3 (12)	24
Atheists	0 (0)	3 (8)	7 (18)	27 (69)	2 (5)	39
Not indicated	2 (29)	0 (0)	1 (14)	3 (43)	1 (14)	7
Group : $\text{Chi}^2(16) = 215.62, p .001$						
Patient	0 (0) ^{a,b,c}	30 (15) ^a	4 (2) ^{a,b,c,d}	159 (80) ^{a,b,c,d}	7 (3) ^{a,b}	200
Nurse's Assistant	6 (15) ^{a,d}	5 (13)	3 (8) ^{a,d}	18 (46) ^{a,d}	7 (18) ^a	39

Nurse	2 (7) ^b	2 (7)	6 (22) ^{b,d}	15 (56) ^{b,d}	2 (7)	27
Medical Assistant	5 (19) ^{c,d}	1 (4)	4 (15) ^{c,d}	14 (52) ^{c,d}	3 (11) ^b	27
Physician	0 (0) ^d	0 (0) ^a	24 (86) ^d	3 (11) ^d	1 (4)	28

Education : Chi²(3)=2.86, p=.43

Primary	0 (0)	19 (14)	3 (2)	112 (82)	3 (2)	137
More than primary	0 (0)	11 (17)	1 (2)	47 (75)	4 (6)	63

Monthly income : Chi²(3)=0.17, p=.98

Less than US\$ 100	0 (0)	18 (15)	2 (2)	95 (80)	4 (3)	119
More than US\$ 100	0 (0)	12 (15)	2 (2)	64 (79)	3 (4)	81
Total	13	38	41	209	20	321

Chi² indicate the strength of the relationship between each demographic variable and the clusters. The figures in parentheses are percentages.

Figures with the same exponent in each column are significantly different, $p < .05$. For example, in the second column, a = significantly lower number of patients in the Infection cluster than of nurse's assistants.

Supplementary Table 1. Mean ratings observed for each scenario

FACTORS					
Infection	Responsibilities	Financial situation	Time	Mean	SD
Very severe	Young father	Insufficient	One year	9.70	1.10
Very severe	Young mother	Insufficient	One year	9.64	1.40
Very severe	Young father	Insufficient	Two months	9.52	1.63
Very severe	Young mother	Insufficient	Two months	9.50	1.73
Very severe	No children	Insufficient	Two months	9.42	1.68
Very severe	No children	Insufficient	One year	9.10	1.88
Severe	Young father	Insufficient	One year	8.90	1.65
Very severe	Old father	Insufficient	Two months	8.82	2.07
Very severe	Old father	Insufficient	One year	8.70	2.09
Severe	Young mother	Insufficient	One year	8.49	1.80
Severe	Young father	Insufficient	Two months	8.38	1.84
Severe	Young mother	Insufficient	Two months	8.29	2.04
Severe	No children	Insufficient	One year	8.25	1.85
Severe	No children	Insufficient	Two months	8.09	1.95
Severe	Old father	Insufficient	One year	7.77	2.20
Severe	Old father	Insufficient	Two months	7.76	2.40
Moderate	Young father	Insufficient	One year	7.07	2.53
Moderate	Young mother	Insufficient	Two months	7.02	2.78
Moderate	Young mother	Insufficient	One year	7.01	2.62
Moderate	Young father	Insufficient	Two months	6.91	2.89

Moderate	Old father	Insufficient	One year	6.61	3.06
Moderate	No children	Insufficient	Two months	6.59	3.10
Moderate	Old father	Insufficient	Two months	6.50	3.22
Moderate	No children	Insufficient	One year	6.36	3.09
Very severe	Young father	Sufficient	One year	5.46	3.05
Very severe	Young mother	Sufficient	Two months	5.31	3.12
Very severe	Young mother	Sufficient	One year	5.30	3.22
Very severe	Young father	Sufficient	Two months	5.23	3.14
Very severe	No children	Sufficient	Two months	5.07	3.08
Very severe	No children	Sufficient	One year	5.05	3.24
Very severe	Old father	Sufficient	One year	4.58	3.01
Very severe	Old father	Sufficient	Two months	4.25	3.06
Severe	Young mother	Sufficient	One year	3.81	3.03
Severe	Young father	Sufficient	One year	3.77	3.00
Severe	Young father	Sufficient	Two months	3.55	2.99
Severe	Young mother	Sufficient	Two months	3.45	2.95
Severe	No children	Sufficient	One year	3.23	3.00
Severe	Old father	Sufficient	Two months	3.16	2.99
Severe	No children	Sufficient	Two months	3.03	2.79
Severe	Old father	Sufficient	One year	2.77	2.78
Moderate	Young mother	Sufficient	One year	1.82	2.54
Moderate	Young father	Sufficient	Two months	1.77	2.52
Moderate	Young mother	Sufficient	Two months	1.76	2.62

Moderate	Old father	Sufficient	One year	1.70	2.62
Moderate	Young father	Sufficient	One year	1.69	2.53
Moderate	No children	Sufficient	One year	1.65	2.46
Moderate	No children	Sufficient	Two months	1.44	2.48
Moderate	Old father	Sufficient	Two months	1.25	2.14

Figure caption

Figure 1. Patterns of results corresponding to "Infection" cluster (upper row panels) and "Financial situation" cluster (lower row panels). The results for the scenarios of families with sufficient income are on the left side and for those of families with insufficient income on the right. The priority ratings for the scenarios are on the y-axis. These are separated according to the identity of the patient (on the x-axis) and the severity of the infection (on the three curves). YF = young father (with four young children); YM = young mother (with four young children), YPWC = young male without children; OF = older father (with adult children).

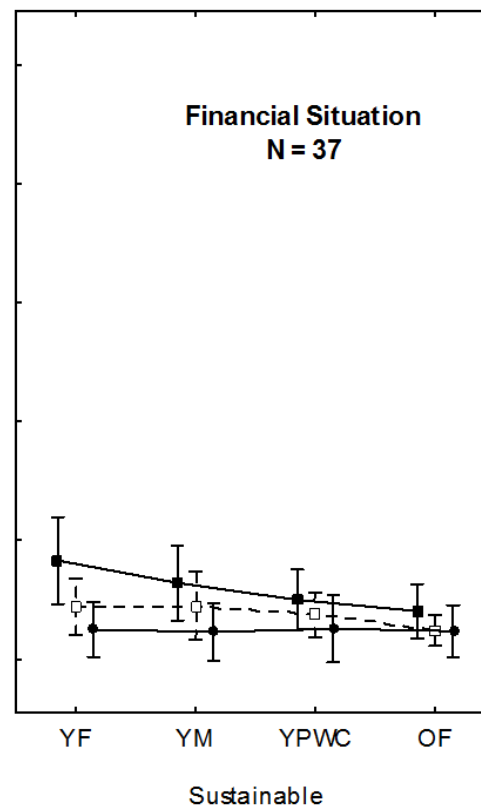
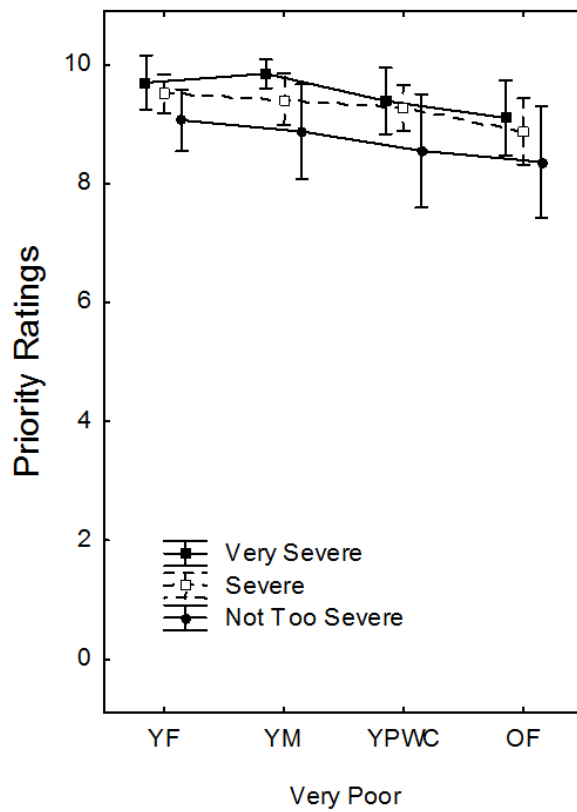
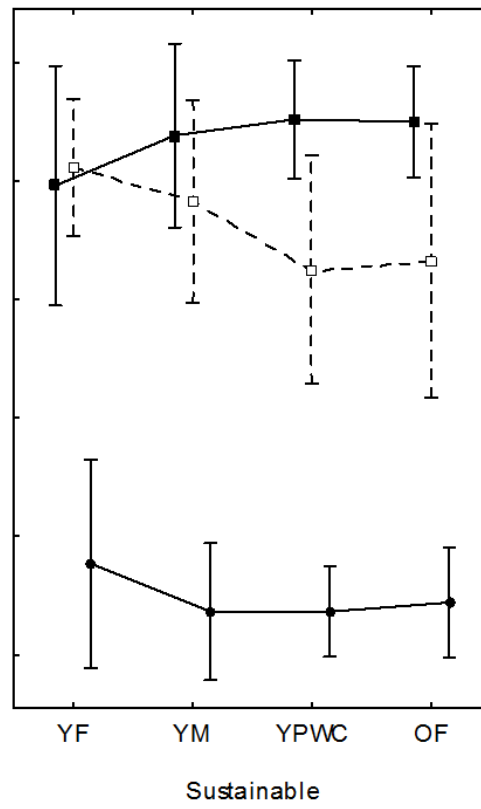
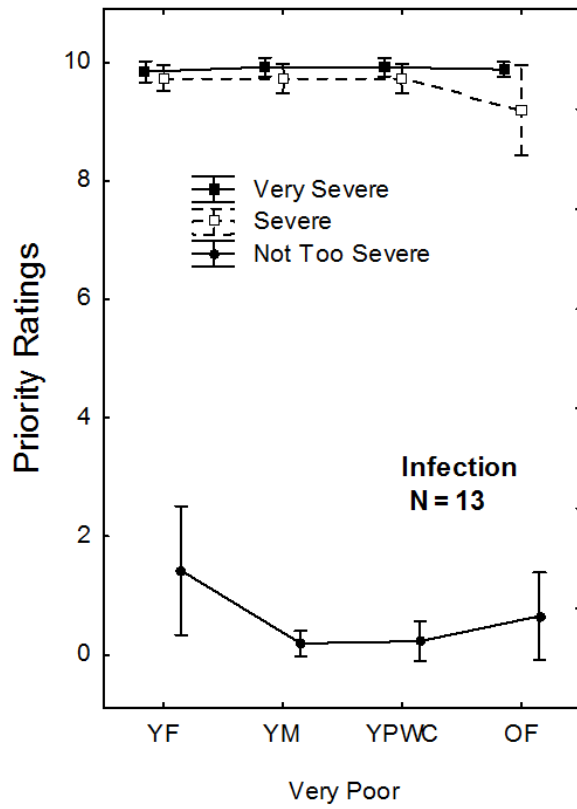


Figure 2. Patterns of results corresponding to "Social situation and Infection" cluster (upper row panels) and "Financial situation and Infection" cluster (lower row panels). The results for the scenarios of families with sufficient income are on the left side and for those of families with insufficient income on the right. The priority ratings for the scenarios are on the y-axis. These are separated according to the identity of the patient (on the x-axis) and the severity of the infection (on the three curves). YF = young father (with four young children); YM = young mother (with four young children), YPWC = young male without children; OF = older father (with adult children).

