

# HaRePo (Harm Reduction by Post): An innovative and effective harm reduction program for people who use drugs using email, telephone and post-service.

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## Research

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# Abstract

*Background:* Despite multiple Harm Reduction (HR) programs worldwide, there are still an important number of people who use drugs (PWUD) who do not access those services. Their difficulties to obtain HR tools are due to their inability to reach such services (remoteness and/or limited customer service hours), costs, quantitative restrictions, fear of judgment, lack of confidentiality in pharmacy and unfamiliarity with HR programs. We tested an innovative approach using the power of remote online communication and the national postal distribution network to improve HR tools access and counselling.

*Methods:* Based on these observations, SAFE association created HaRePo in 2011, a free and confidential program designed for people who have difficulties accessing HR tools and counselling. PWUD can access the program by phone and/or email. An HR professional delivers HR counselling, HR tools and connects PWUD to other HR services, medical, and social workers. HR tools are prepared and sent according to the person's needs through the French postal service to consumers across Metropolitan France and overseas territories.

*Results:* Since 2011, 1920 PWUD have benefited from HaRePo: 10,450 parcels were sent accounting for more than 1.7 million syringes and 6 million HR related items. HaRePo receives positive feedback from PWUD who have improved their practices through remote but trusted communication. The percentage of people that, after joining the program, never reuse and/or share HR tools have significantly increased. On average 71.5% of beneficiaries never reuse syringes and 81% do not reuse needles. And they are 98.5% consumers who never share syringes and 99% needles any longer. Between 44% and 80% HaRePo beneficiaries have reported that their drug-related practices (injection, inhalation and snorting) are now safer. Finally, between 39% and 53% HaRePo consumers declared that their overall physical state has improved (e.g., venous condition, the appearance of point of injection, swelling of arms, legs, and hands).

*Conclusion:* HaRePo is an innovative HR program efficient for hard-to-reach PWUD. It shows evidence of a positive feedback loop for PWUD in improving their practices. Finally, HaRePo represents a clear benefit for health authorities in France, who decided to expand the program in 2016.

## Background

Harm reduction (HR) programs consist in providing support and HR tools to PWUD to reduce the harms associated to drugs consumption. They result in significant reduction of health risks for drug consumers. HR is one of the most efficient strategies used in order to decrease Human Immunodeficiency Virus (HIV) and hepatitis transmission [1–3]. HR also reduces other health risks associated with drug use like skin

and soft tissue infections, which involve microbial invasion of the skin and underlying soft tissues [4]. HR strategies can also reduce overdose [5]. Moreover, HR provides a gateway to drug treatment programs for drug consumers and decreases social risks by supplying information and advice in a non-judgmental manner [6].

In France, HR started in 1987 with a Minister of Health decree allowing the free sale of syringes in pharmacy. This scheme was subsequently supplemented by other programs such as syringe exchange programs 1990 and opioid substitution programs in 1994. Finally, HR was established by law in 2004 [7]. In 2005, the care and support centres in harm reduction for drug consumers called CAARUD (Centres d'Accueil et d'Accompagnement à la Réduction des risques pour Usagers de Drogues in French) were created. Their missions are to welcome, inform and personalize counselling for PWUD. PWUD support includes the distribution of HR tools, personal care support and access to the general health care system, and detection of transmissible diseases; the low threshold structures missions are detailed in Decree 2005-1606 of December 19, 2005 [8]. The same legal structure also created the CSAPA care centre for addiction support and prevention (Centre de Soins, d'Accompagnement et de Prévention en Addictologie, in French) whose mission is to provide prevention and care for people who suffer from addictions (e.g., drugs, alcohol gambling, screens, sex). Despite the French governmental actions concerning HR, there are still many PWUD who have difficulties to access to HR services in the country [9]. In fact, a growing number of PWUD have reported difficulties in finding sterile materials. Several reasons have been highlighted: difficulty of accessing HR structures (distance and/or limited customer service hours), material cost and/or lack of confidentiality in pharmacies, material quantity restrictions, unfamiliarity with HR programs, fear and shame. These difficulties induce high-risk behaviour in drug consumption (e.g. injection practices), like reuse and sharing of syringes and HR tools. Most non-urban areas have no specialized care infrastructure to diagnose, monitor and accompany PWUD, [10] and indeed historically drug use and PWUD have been studied and discussed primarily from an urban perspective. Not only have consumers of non-urban areas not been studied or supported, but these areas are hardly supervised by the authorities and are therefore commonly used for drug trafficking [11]. This information is important because the drug trafficking routes are predictive of HIV spread in rural areas, as has been demonstrated in China [12], India [13] and Southeast Asia [14]. Studies about PWUD living in rural areas are scarce. Only a few studies conducted in the Appalachians (USA) [15] or remote Australia [16] attempted to draw a coherent picture of the situation and needs of these populations. Rural populations seem to get their equipment from several sources but do not count on pharmacies [17]. In the USA, recent reports show a sharp increase in the number of new cases of hepatitis C among PWUD living in non-urban areas, especially among young people. In 30 out of 34 states, incidence of Hepatitis C has increased between 2006 and 2012, particularly in rural counties east of the Mississippi. The absence of HR centres or syringe exchange practices in rural areas is believed to be one of the causes of the increased incidence of HCV (Hepatitis C virus) [18].

Based on these observations, we created HaRePo (Harm Reduction by Post) in 2011, an individualized, customized, confidential and free HR service with 3 main objectives: (1) to facilitate the access of HR-related items, especially for consumers who do not access and/or have difficulties accessing the

classical HR network in sufficient quantity and variety to satisfy their needs, (2) to provide HR counselling and information about health risks associated with drug use and other harmful behaviors (like reuse and sharing of syringes), (3) to connect consumers with additional legal, healthcare or other HR services. To our knowledge HaRePo was the very first program in the world to propose such kind of services to PWUD. The programme looks to build new HR alternatives for PWUD.

The HaRePo program is managed by the SAFE association who has developed for the last 25 years several HR strategies in France. SAFE is a pioneer in the creation and evolution of HR paraphernalia: filtration tools [19], injection kits (including an efficient filter against bacteria), inhalation material (proposing free street-based automatic inhalation kit dispensers) and others. SAFE also manages 90 of 300 street-based automatic injection kit dispensers (AIKD) in France. SAFE has contributed to the evaluation of the AIKD as a part of a comprehensive HR strategy [20]. It has also participated in the development of a method using mass spectrometry detection to analyse residual content of used syringes [21,22] and has provided information for HCV studies [23].

In this study, we present and analyse the results of seven years of HaRePo activity. This alternative HR program has established a country-wide and overseas postal-based HR service for hard-to-reach PWUD.

## Methods

### What is HaRePo?

HaRePo (Harm Reduction by Post) is an innovative HR program designed for people who have difficulties accessing HR tools and advice. HaRePo is a postal delivery service combining regular national postal service with a well-established social and personal communication scheme (professionals respond to telephone calls and emails during in the day) to provide HR counselling and information. Consumers typically receive HR tools two days after the initial contact.

### How does HaRePo work?

In 2011, SAFE advertised HaRePo by a short message on their website (<http://www.safe.asso.fr>) and on the most frequented online forum of drug consumers in France (Psyccoactif, <https://www.psychoactif.org>). Since then, the number of consumers has consistently increases, mainly by word of mouth. PWUD can access the program via a 24/7 telephone line (a voice box records orders outside working hours) and/or by e-mail.

Professionals are available to answer questions, deliver HR counselling and connect consumers with other services when necessary (e.g. face-to-face HR services, diverse healthcare services). Then, professionals record orders of HR tools according to the consumer's needs (e.g. substance consumed, consummation frequency, practices) and tailor the quantity of HR tools sent out. The applicants are identified by a code to prevent recording of personal information is recorded. Thus, confidentiality is ensured, and strictly follows the guidelines of the National Commission for Informatics and Liberties

(CNIL). Once the HR tools order is registered, a logistical team prepares the parcels following strict hygiene preparation conditions. Parcels are finally sent in unmarked packaging through the French postal service to consumers registered across France including French overseas territories. Each parcel has a tracking number to track delivery and delays. Usually, consumers receive parcels 48 hours after the initial contact (Fig. 1). The HR tools list provided by HaRePo program is presented in an additional file [see Additional file 1].

In order to monitor the entire program, and to ensure consumers' confidentiality, software was developed by the company TAGALIS ([www.tagalis.com](http://www.tagalis.com)) specifically for this program. Each consumer is anonymised by encoding a specific ID code. This software allows us to (i) register consumer information (e.g., gender, age, consumer housing and working situation), (ii) HR item delivery history (iii) psychoactive substances used, (iv) characteristics and improvement in consumers HR practices (e.g., sharing paraphernalia, reusing syringes) and (v) HR advice and references provided. This allows for a secure but accessible data structure for monitoring. So far, all such information has been recorded for 1,920 PWUD during the 7 years of the study. The study including questionnaires development, data analysis and writing was performed by the association SAFE who developed and delivered the HaRePo program.

## **Evaluation of the program by PWUD**

In order to evaluate the program and its impact on PWUD behaviour, we randomly distributed 300 Multiple Choice Questionnaire (MCQ) with comment boxes from April to June 2018 to HaRePo consumers. Each questionnaire was distributed with a short instruction manual. The only inclusion criterion was for the respondent to be registered in the HaRePo program since 2017. The questionnaires were sent within the parcels with a pre-stamped envelope. PWUD answered the questionnaire without the presence of any HR professional (questionnaires were answered remotely and anonymously). The response rate was 32%. We analysed and present below results based on 96 answers. It is important to note that our results are based on self-reporting questionnaires and the practices/health improvements were not monitored independently. This is known to induce bias in the responses [24] but some methods exists to reduce such bias [25] and the questionnaire used in this study followed most of those recommendations.

## **Data analysis**

### **Statistical analysis**

All analyses were performed using the software R.3.5.1 (R Core Team, 2018). We use a linear model to study the correlation between two parameters. For instance, we correlate the time since the program creation and the number of PWUD using the slope of the linear model as a proxy for the adherence rate. We estimated correlation as well as its 95% confidence interval. We then divided our database into four parts, depending on the population density in the consumer living area (with 1 indicating a city and 4 a rural area), and based on the data from the French National Institute for Statistics and Economic Research (INSEE). Currently in France, they represent respectively Zone 1 [Total: 18.219.100], Zone 2

[Total: 24.778.600 habitants], Zone 3 [Total: 19.142.230 habitants], Zone 4 [Total: 2.533.000 habitants]. We considered that adherence rates for two different zones are significantly different when their respective 95% confidence interval do not overlap.

We also studied the correlation between PWUD motivations to join the program and their residence [population density zone as defined above]. We test such correspondence by Pearson's Chi-square. We considered any difference as significant when the p-value was  $\leq 0.05$ .

## Qualitative data

All the qualitative data showed here (mainly testimonies) were collected through e-mails exchanges that were then combined into anonymous reports. They are used only to contextualize the quantitative data. During these exchanges, the discussion is free and the HR professional follow strict rules to avoid judgment and induce trust with the consumer (if is needed HR professional can use motivational interviewing techniques). Thus, consumers can speak freely and share personal feelings. In order to select quotas presented here we made a key word research in the reports (chemsex, pharmacy problems, CAARUD/CSAPA problems...). Quotas showed here were chosen randomly thus we noticed that most of the testimonies are similar and converge into similar topics and opinions.

## Results

### General observations

Since its creation in 2011, almost 2,000 PWUD have benefited from the HaRePo program. PWUD using HaRePo have increased from 42 consumers in 2011 to 881 consumers in 2018 (Fig. S1a). The number of parcels sent increased concomitantly. More than 10,000 parcels have been sent to date, from 71 parcels in 2011 to 3,118 parcels in 2018 (Fig. S1b). This accounts for more than 6 million HR-related items (including 1,720,295 syringes). Most of the HR paraphernalia sent corresponds to items used in injection practices: intravenous injection/intramuscular injection/plug [97%]; and inhalation/snorting [3%] (Fig. S1c). An important amount of information concerning HR practices was sent within each parcel, including flyers, videos on USB memory stick or CD-rom, and others. The number of HR items distributed by HaRePo has grown steadily from less than forty-five thousand per year in 2011 to more than 1,5 million per year in 2018 (Fig. S1c). The success of the program is partially due to "word of mouth" communication between consumers benefiting from the program, in particular through a well-know forum used by PWUD in France called "psychoactive".

- *" Me and my friend saw your add on the Psychoactif website which says that SAFE is setting up a service to access injection equipment by post. We would like to have more information on this service."*

### Consumer profile

*HaRePo address the specific needs of consumers who are not accessing classical HR centres*

HaRePo is more accessed by women (25%) than classical HR centres. Women represent 18% of the CAARUD consumer cohort [26]. We did not identify a unique motivation for women to enter the program and the following testimonies suggest that motivations might be quite diverse:

- *"I am an eternal drug addict. I take subutex. I have the misfortune to shoot it. I appreciated your cream as my arms are now less marked. In addition I can filter the products and I have the HR equipment I need. I am not putting myself in danger. You have no idea how much you are relieving the weight of my guilt. Finally I really take into account that I need to get away from drugs. I am no longer alone facing all this. Thank you".*

- *"HaRePo changed my life. I live in a small town and the only pharmacy selling injection kits is 15 km away and it sells them for 3 € each, so I usually use 2 kits for 1 month. Now I can finally do 1 session / 1 syringe!"*

- *"I am afraid of going to the CAARUD alone. I am afraid to be judged. I am a pretty anxious person". - "I am a drug addict. It is difficult for me to find HR equipment. I don't really know the addresses of centres in my town. I do not have money to buy injections kits in pharmacies and I am afraid of people's gaze at me and my drug problem. I would like to know how much material can I order for a daily consumption of heroin and oxycodone. Among other things, I have heard of "wheel filters" which seems to be very effective in filtering out the excipients of oxycodone but are difficult to find in my situation". - "I do not want to go to HR centres because I am afraid to lose my daughter's custody. I don't want to expose neither my child nor myself".*

Among program beneficiaries, the number of people engaging in chemsex (Drug use for or during sex) is increased steadily from one in 2012 to 119 in 2018. A total of 170 people engaging in chemsex have benefited from the program. They represent 9% of the total HaRePo beneficiaries and 11% in 2018. The chemsex practice does not only concern consumers in the urban zones (18% of consumers live in areas of low or very low urban density). HaRePo consumers have a stable accommodation 87% versus 50% in CAARUD [27]. Ten percent of consumers live in an accommodations belonging to a third party (i.e. family, friends...) and only 3% of consumers do not have a stable accommodation (Fig. 2a).

### *Consumers profile*

Most consumers (82%) accessing the program are injectors and 94% of them have combined practices: injection and/or inhalation and/or snorting. Most of the people engaging in chemsex declared themselves to be 'slamming' (the action of injecting drugs in a sexual context). A small proportion of PWUD do not inject drugs. The structure of our dataset did not allow us estimating whether there are significant differences depending on their consumption practices. Therefore, we presented here results of both groups (injectors and non-injectors).

The most common substances used are opioids (1035 consumers) like heroin (484 consumers), Buprenorphine (280 consumers), Skenan® (255 consumers) and methadone (16 consumers), in addition

to oxycodone and Oxycontin®. Moreover, 735 respondents are stimulants consumers with 406 of them consuming cocaine and 329 consuming crack/freebase. Finally, 152 consumers declare consuming New Psychoactive Substances (NSP), primarily 4-methyl-N-ethylcathinone (4-MEC) and x-methylmethcathinone (X-MMC) (Fig. 2b). However, most of PWUD in the program declare to use multiple drugs.

## Consumer motivations

Consumers decide to use the HaRePo program for different reasons. The first reason declared by 680 consumers is because of the distance between where they live and the nearest HR centre. The majority of those consumers live in small towns where there are no low threshold structures. The second reason mentioned (442 consumers) is difficulties with the local HR centres like non-compatible service hours, or when HR centres do not have materials or only in insufficient quantities. The third reason for consumers (310 consumers) to join HaRePo instead of HR centres is consumers seek for anonymity and fear of stigma. This result was confirmed by consumers' testimonies:

- *"This service is really great, really suitable for people who, like me, want real anonymity."*
- *"Very few people around me are aware of my drug use (two "friends"), and even my family does not know anything about my treatment and it is very good like that at the moment because I hardly need to speak about it. I buy my injection kit in pharmacies but would like filters because I reuse the same syringes at least 4 times and there are only two filters per kit ... the cotton I use filters less well and is not sterile. You will tell me that I could go to a centre or AIKD, I do not dare, I am afraid that friends or acquaintances, worse, my colleagues would pass by and see me exchanging my syringes, entering the centre or because they are inside."*
- *"It's very small here!!! And then, small or not, I know few people who accept the idea that one of their "colleagues" or "partners" is addicted! "*

We noted that anonymity was particularly often mentioned by consumers practicing chemsex:

- *"In fact, I practice slam and saw the recrudescence of HCV contamination (I was infected). I do not dare to go to CAARUD because I will be immediately stigmatized, and the automatic injection kit dispenser is always empty".*
- *"I need equipment for injecting and snorting. A friend with whom I practice slam and chemsex told me about you. I do not go to an association because few people know that I use drugs. I do so only in sexual practices. I really do not have a lot of tools. I use the syringe of a friend and I do not want to do it again. To snort I use a ticket or something like that. Is it possible to communicate only through the internet because I am too afraid by phone?"*
- *"My schedule (working hours) does not correspond at all with CAARUD's customer services hours".*
- *"I practice slam and I live in a small village, and I do not have a vehicle"*

- *“I practice chemsex, I slam since some time with some partners and I use 3-MMC. In fact, I am a little ashamed to go buy injection kits in pharmacy because of their reaction. So I use or scrounge material from my partners, but some grumble a little”*
- *“I realize that many slammers are in the same situation. Finding injection kits in pharmacies is very complicated and the new people adopting this practice do not know needle syringe exchange structures or do not want to go to such structures”*

Several other motivations were mentioned: during holidays where the centres are closed (196 consumers), similar difficulties encountered with pharmacies (173 consumers), lack of information about HR programs and tools which exist (170 consumers), not able to go to HR centres because of disability for instance (81 consumers) and finally for personal reasons such as shame (65 consumers). Additionally, we observed that consumers sometimes declare more than one reason that incited them to join the program (Fig. 2c).

- *“I myself am a consumer but I have so far found it very difficult to get equipment, not knowing the address of centres in my city, not having the funds to request in pharmacies and knowing the fear of people's gaze on my consumption”.*

### **Motivations to join the program vs. consumers' residential area**

Using linear models, we estimated how rapidly PWUD enter the program and if this entrance rate depends on their residential area (Fig. S2). We observed that on average, 0.06 PWUD per 100,000 habitants enter the program each year (Table 1).

Nevertheless, this rate was not significantly different between the four residential zones (density zones). This means that the density zone (urban or rural) does not play an important role in new HaRePo consumers. Nevertheless, using Pearson's Chi-square tests, we found that residential area has an influence on consumer motivations to join HaRePo. We observed that HaRePo consumers living in zones type 1 and 2 (large and intermediate cities) mainly use the program because they feel they do not fit in with PWUD who frequent classical HR centres ( $p < 0.001$ ) and because they need timely materials (ex: HR tools) ( $p < 0.05$ ). Moreover, the principal reason for PWUD living in zones type 3 and 4 (semi-rural and rural areas, respectively) to join the program is their distance from classical HR centres ( $p < 0.0001$ ) (Table 2).

Results show that HaRePo receives PWUD from urban and rural population but the reasons to join the program are different.

### **Program impact**

The program seems to induce a positive feedback loop in its consumers. They improve their practices based on remote but trustworthy communication. Furthermore, the percentage of people that, after accessing the program, never reuse and/or share HR tools have increased. Indeed, 71% to 72% of beneficiaries never reuse syringes and 81% never reuse needles. Concerning other HR items, the level of

improvement varies from 14% to 49% (Fig. 3a). Regarding sharing practices, 98% to 99% of consumers declare never sharing syringes and 99% for needles. Moreover, the percentage of consumers that never share other kinds of HR paraphernalia once they have joined HaRePo improved from 9% to 26% (Fig. 3b). In addition, between 39% and 53% of HaRePo consumers declared that the perception of their own health status and physical appearance (e.g. the appearance of injection points, swelling of extremities, veins) has clearly improved (Fig. 4a). Finally, depending on the practices 44% to 80% of beneficiaries report that since they entered into the program the safety of their consumption practices (injection, inhalation and snorting) has improved or greatly improved (Fig. 4b).

## Discussion

- **HaRePo shows evidence of a positive feedback loop as PWUD improve their practices through remote but trusted communication**

Establishing remote connections with patients who have difficulty accessing classical health centres is an emerging practice in medicine that has been successful at improving access to health centres in several specific countries such as Australia [28] and South Africa [29] but also seems general to other countries as showed by the review of Win *et al.*, (2015). Remote support groups also help to satisfy the need for emotional support [31]. These benefits extend to the HaRePo program that has reached populations without easy access to HR structures or tools, including women and/or rural populations. Nevertheless, the benefits of such remote programs may be limited to patients with relatively high digital literacy or at least with internet connection [29]. By proposing a phone service, HaRePo overcomes this difficulty and may reach PWUD with low access to Internet facilities. As a whole, HaRePo is a successful program to improve PWUD practices through remote but trusted communication that helps to have a long-term monitoring of PWUD practices.

- **HaRePo : a program adapted for women**

Women are among the priorities of HR strategies in France and in Europe [32], HaRePo seems to reach more women than low threshold structures (CAARUD) in France. A higher proportion of women are found among HaRePo consumers (25%) than PWUD frequenting CAARUD (18%) [26].

Women have been estimated to represent about 40% of consumers in the United States and some parts of Europe, 20% in Eastern Europe, 17% in Central Asia and 40% in Latin America [33]. Nevertheless, precise quantitative data on women who use drugs are rarely available. Furthermore, the stigma attached to women who use drugs and alcohol has been highly documented, for instance a survey in Russia Gorshkova & Shurigina, (2003) showed that 21% of those interviewed declared that a wife's drug or alcohol addiction was a valid reason for her husband to beat her. Pinkham & Malinowska-Sempruch, (2008) examine ways in which gender-related factors can increase female drug consumers' vulnerability and decrease their access to harm reduction, drug treatment, sexual and reproductive health services. This study also highlighted the stigma and discrimination for women using drugs during

pregnancy and/or with children [36,37]. In fact, peer pressure encourages women to conceal their drug use, limiting their access to HR information and HR structures [38]. Women who use drugs require new HR approaches to take into account their specific needs about anonymity, confidentiality sexuality, pregnancy and motherhood.

- **HaRePo: a program adapted for people engaging in chemsex**

The most important reason to use HaRePo services declared by people engaging in chemsex is the fear of stigma as they seek anonymity. The second reason is that HR centres are not compatible with their needs (need specific HR equipment and/or specific quantities, non-compatible service hours...). The third reason is that some of them live in small towns far from HR centres. Other reasons often cited are the costs of material and/or the lack of confidentiality in pharmacy and finally the unfamiliarity with classical HR programs as indicated in consumer testimonies presented in the results section.

A study about chemsex in France [39] pointed out the need to adapt HR equipment delivery for people injecting products in a sexual context. Indeed, their needs are not the same as those of consumers traditionally received in HR structures. Moreover, findings from Bourne *et al.*, (2015) indicate that generic drug services, typically designed to address the needs of opiate consumers, may not be sufficiently resourced to address the specific and acute needs of gay men engaged in chemsex. They highlighted the need to facilitate the access to larger quantities of injection equipment for slammers. They noted a persistent difficulty among these groups in reaching structures dedicated to consumers. They also insisted on the importance of designing and promoting HR tools adapted to the products consumed in the context of chemsex [39].

The same study showed either a complete lack of knowledge about HR network and care system, or a great difficulty in mobilizing it for people engaging in chemsex living in rural areas and for those who are outside the gay social network. In fact, these persons prefer to frequent HR services far from their place of residence in order to preserve their confidentiality and/or anonymity. It has been highlighted [41] that a rapidly changing pattern of drug use is emerging (chemsex) that requires health services to find new approaches to HR. Indeed some studies show the greater need of adapted harm reductions services for people engaging in chemsex [42]. In general, authors recommend a non-judgemental and sensitive approach to facilitate conversations about harmful drug use and practices [39,41]. HaRePo is a HR approach that emphasizes non-judgemental and trustful remote communication. Moreover, we provide HR tools adapted to chemsex context. This may also explain the HaRePo success with people engaging in chemsex.

- **Is HaRePo a solution adapted to other countries?**

We showed that HaRePo is a successful program that reaches populations who do not have access to classical HR centres. We identified three main hard-to-reach populations: rural or semi-rural populations, women and people engaging in chemsex. These populations share the fear of stigma when going to classical harm reduction centres as shown by the consumers' testimonies presented in the results section.

These populations are not exclusively observed in France and we consider that our program is a suitable response to the hard-to-reach populations problematic in other countries with some adaptations regarding local conditions and socio-cultural particularities. The difficulty to access harm reduction tools for these populations was already identified in several countries (see [43] for review). Moreover, several times a year PWUD in neighbouring countries (especially Belgium, Switzerland, and Spain) contact us to benefit from HaRePo. However, additional financial resources are necessary to be able to send HR tools abroad.

For instance, rural populations suffering from their distance to classical structures was observed in the USA [44], Canada [10], Australia [45], UK [46,47], China [12,48], Kenya [49], and Iran [50]. This difficulty due to the distance may in some cases be associated to gender issues [51,52]. Developing HaRePo-like program in those countries may partially answer this challenge. The key aspects of HaRePo are anonymity, a rapid adaptation to new types of consumption, and free access to a large diversity of harm reduction equipment adapted to most of the practices we observed. Anonymity is particularly important because fear of stigma is a limiting factor to take advantage of classical HR centres and to directly access HR equipment in pharmacies [53,54].

Following these principles, HaRePo may be easily adapted to any other situations respecting some local socio-cultural particularities. Nevertheless, it must be noted that HaRePo benefits from efficient post services which may not be the case in some countries. Moreover, the success of HaRePo is also partially due to the publicity made by PWUD on some self-managed Internet forums where they exchange information on different topics including harm reduction. We regularly present our program on the main forums and consequently countries where PWUD are internet-connected may be reached more efficiently.

Finally, a similar program was developed in the USA in 2017 and is called NEXT DISTRO (<https://nextdistro.org/>). This program, which developed independently from HaRePo, demonstrates the possibility to develop remote harm reduction policies in different countries as far as they respect the key aspects presented in this study.

## Conclusions

HaRePo is an innovative HR program efficient for hard-to-reach PWUD including women, people engaging in chemsex and PWUD living in rural areas. We showed evidence that the program is efficient to improve PWUD practices through remote but trusted communication using social and digital media. PWUD engaged with HaRePo increase constantly despite it mainly expanding by word-of-mouth. Its success allows us to plan new remote access related projects: remote screening for hepatitis B and C, HIV by Dried Blood Spot test project and an online training called naloxone ([www.naloxone.fr](http://www.naloxone.fr)). We noted that most of the PWUD in HaRePo program are people injecting drugs often associated to other consumption practices (inhalation, snort, etc.). A reduced proportion of PWUD do not inject drugs and the structure of our dataset did not allow us to estimate whether the HaRePo program has a different impact on injectors versus non-injectors. Since most of the consumers in HaRePo are people injecting drugs we are confident

on the positive effect of HaRePo but further research must be performed to confirm this results in among PWUD who do not inject drugs. Finally, HaRePo represents a clear benefit for the French Health Authority as they decided to expand the program in 2016. The association SAFE continues to lead HaRePo and proposes different trainings for the new associations (in the different administrative regions of France) that join the program. However, to ensure the continuity of the program more financial support is needed.

## **Declarations**

### **Ethics approval**

The study was approved by the Institutional Board of SAFE.

### **Consent for publication**

Not applicable

### **Availability of data and materials**

The datasets analysed during the current study are available at:

<https://www.dropbox.com/s/q4lwfc2eaqcpdh/Equipment%20distribution%20by%20year.xlsx?dl=0>

and

<https://www.dropbox.com/s/9ohfaxpjwscnfxg/users%20information.xlsx?dl=0>

### **Competing interests**

The authors declare that they have no competing interests.

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### **Authors' contributions**

CD and EGR designed the program. CD and MTL supervised the data collection. MTL conducted the statistical analysis and write the first version of the manuscript. All the authors contributed to the final version of the manuscript.

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CD is Director of the SAFE association, a public health association specialized in harm reduction for PWUD in France. She is involved in the implementation and co-ordination of a risk reduction program which aims to develop and promote the most appropriate tools and methods of intervention in the fight against viral, bacterial and fungal infections. The program includes the development of an automated syringe exchange, the dissemination of inhalation kits in Île-de-France and the postal of dry-blood spot testing for infectious diseases including HCV from rural areas.

# Abbreviations

**HaRePo** Harm Reduction by Post

**HR** Harm Reduction

**PWUD** People Who Use Drugs

**CAARUD** Centre d'accueil et d'accompagnement à la réduction des risques des usagers de drogues

**CSAPA** *Centres de soins, d'accompagnement et de prévention en addictologie*

**CNIL** Commission Nationale de l'informatique et des Libertés

**AIKD** Automatic Injection Kit Dispensers

**HCV** Hepatitis C virus

**NSP** New Psychoactive Substances

**4-MEC** 4-methyl-N-ethylcathinone (4-MEC)

**X-MMC** x-methylmethcathinone

more financial support is needed.

# References

1. Hurley SF, Jolley DJ, Kaldor JM. Effectiveness of needle-exchange programmes for prevention of HIV infection. *Lancet*. Elsevier; 1997;349:1797–800.
2. Drucker E, Lurie P, Wodak A, Alcabes P. Measuring harm reduction: the effects of needle and syringe exchange programs and methadone maintenance on the ecology of HIV. *AIDS*. 1998;12 Suppl A.
3. Van Den Berg C, Smit C, Van Brussel G, Coutinho R, Prins M. Full participation in harm reduction programmes is associated with decreased risk for human immunodeficiency virus and hepatitis C virus: evidence from the Amsterdam Cohort Studies among drug users. *Addiction*. 2007;102:1454–62.
4. Dunleavy K, Munro A, Roy K, Hutchinson S, Palmateer N, Knox T, et al. Association between harm reduction intervention uptake and skin and soft tissue infections among people who inject drugs. *Drug Alcohol Depend*. 2017;174:91–7.
5. Hawk KF, Vaca FE, D'Onofrio G. Reducing Fatal Opioid Overdose: Prevention, Treatment and Harm Reduction Strategies. *Yale J Biol Med*. 2015;88:235–45.
6. Bartlett R, Brown L, Shattell M, Wright T, Lewallen L. Harm reduction: compassionate care of persons with addictions. *Medsurg Nurs*. 2013;22:349–53, 358.

7. Bello PY, Ben Lakhdar C, Carrieri MP, Costes JM, Couzigou P, Dubois-Arber F. Réduire les risques infectieux chez les usagers de drogues par voie intraveineuse. Editions I. Paris, France; 2009.
8. Morel A, Chappard P, Couteron J-P. L'aide-mémoire de la réduction des risques en addictologie: en 22 notions: contexte, enjeux, nouvelles pratiques. Dunod. Paris, France; 2012.
9. Jauffret-Roustide M, Nefau T, Karkolak S-L, Pourchon F, Chappard P. Usages et usagers de l'information. Paris, France; 2016.
10. Parker J, Jackson L, Dykeman M, Gahagan J, Karabanow J. Access to harm reduction services in Atlantic Canada: Implications for non-urban residents who inject drugs. *Heal Place*. 2012;18:152–62.
11. UNODC. World Drug Report. Vienna, Austria; 2007.
12. Liu W, Chen J, Rodolph M, Beauchamp G, Mâsse B, Wang S, et al. HIV prevalence among injection drug users in rural Guangxi China. *Addiction*. 2006;101:1493–8.
13. Sarkar K, Panda S, Das N, Sarkar S. Relationship of national highway with injecting drug abuse and HIV in rural Manipur, India. *Indian J Public Health*. 1997;41:49–51.
14. Beyrer C, Razak MH, Lisam K, Chen J, Lui W, Yu XF. Overland heroin trafficking routes and HIV-1 spread in south and south-east Asia. *Aids*. 2000;14:75–83.
15. Moody L, Satterwhite E, Bickel W. Substance Use in Rural Central Appalachia: Current Status and Treatment Considerations. *Rural Ment Health*. 2017;41:123–35.
16. Australian Institute of Health and Welfare. Alcohol and other drug use in regional and remote Australia: consumption, harms and access to treatment. Canberra; 2019.
17. Rozzoli K, Smith P, Evans K, McGrath D, Hefford J, Field L, et al. National Drug And Alcohol Research Centre Annual Report. 2005.
18. Zibell J, Iqbal K, Patel R, Suryaprasad A, Sanders K, Moore-Moravian L, et al. Increases in Hepatitis C Virus Infection Related to Injection Drug Use Among Persons Aged  $\leq 30$  Years – Kentucky, Tennessee, Virginia, and West Virginia, 2006–2012. *Morb Mortal Wkly Rep*. 2015;64:479–81.
19. Jauffret-Roustide M, Chollet A, Santos A, Benoit T, Péchiné S, Duplessy C, et al. Theory versus practice, bacteriological efficiency versus personal habits: A bacteriological and user acceptability evaluation of filtering tools for people who inject drugs. *Drug Alcohol Rev*. 2018;37:106–15.
20. Duplessy C, Reynaud EG. Long-term survey of a syringe-dispensing machine needle exchange program: answering public concerns. *Harm Reduct J*. 2014;11:16.
21. Néfau T, Charpentier E, Elyasmino N, Duplessy-Garson C, Levi Y, Karolak S. Drug analysis of residual content of used syringes: A new approach for improving knowledge of injected drugs and drug user practices. *Int J Drug Policy*. 2015;26:412–9.
22. Nordmann S, Nefau T, Micallef J, Duplessy C, Catusse JC, Frauger E. Which psychoactives substances are found in used syringes? *Thérapie*. 2016;
23. Thibault V, Bara JL, Nefau T, Duplessy-Garson C. Hepatitis C transmission in injection drug users: Could swabs be the main culprit? *J Infect Dis*. 2011;204:1839–42.

24. Johnson T, Fendrich M. Modeling sources of self-report bias in a survey of drug use epidemiology. *Ann Epidemiol.* 2005;15:381–9.
25. Choi BCK, Pak AWP. A catalog of biases in questionnaires. *Prev Chronic Dis.* 2005;2:1–13.
26. Mutatayi C. Résultats de l'enquête Ad-femina. *Obs. Français des Drog. Toxicom.* 2019.
27. Costes J. Rapport national 2012 ( données 2011 ) à l' OEDT par le point focal français du réseau Reitox France tendances et information détaillée sur des thèmes spécifiques REITOX. 2010.
28. Moffatt JJ, Eley DS. The reported benefits of telehealth for rural Australians. *Aust Heal Rev.* 2010;34:276–81.
29. Anstey Watkins JOT, Goudge J, Gómez-Olivé FX, Griffiths F. Mobile phone use among patients and health workers to enhance primary healthcare: A qualitative study in rural South Africa. *Soc Sci Med.* 2018;198:139–47.
30. Win KT, Hassan NM, Bonney A, Iverson D. Benefits of Online Health Education: Perception from Consumers and Health Professionals. *J Med Syst.* 2015;39:27.
31. Chung JE. Social networking in online support groups for health: How online social networking benefits patients. *J Health Commun.* 2014;19:639–59.
32. MIDECA. Alcool, tabac, drogues, écrans : Plan national de mobilisation contre les addictions 2018-2022. Paris, France; 2018.
33. Doherty MC, Garfein RS, Monterroso E, Brown D, Vlahov D. Correlates of HIV infection among young adult short-term injection drug users. *Aids.* 2000;14:717–26.
34. Gorshkova E, Shurigina I. Violence against women in Russian families. Moscow State University, Lomonosov; 2003.
35. Pinkham S, Malinowska-Sempruch K. Women, Harm Reduction and HIV. *Reprod Health Matters.* 2008;16:168–81.
36. Babakian G. Positively Abandoned. Stigma and Discrimination against HIV-Positive Mothers and their Children in Russia. *Human Righ. Watch HR*, editor. New York; 2005.
37. Reinerman C, Levine HG. Crack in America : demon drugs and social justice. University of California Press; 1997.
38. Murphy S, Rosenbaum M. Pregnant women on drugs : combating stereotypes and stigma. New Brunswick, NJ: Rutgers University Press; 1999.
39. Milhet M. Attentes et PArcours liés au CHEmSex. *Observatoire Français des Drogues et des Toxicomanies*, editor. Paris, France; 2019.
40. Bourne A, Reid D, Hickson F, Torres-Rueda S, Steinberg P, Weatherburn P. "Chemsex" and harm reduction need among gay men in South London. *Int J Drug Policy.* 2015;26:1171–6.
41. Ma R, Perera S. Safer chemsex: GPs' role in harm reduction for emerging forms of recreational drug use. *Br J Gen Pract.* 2016;66:4–5.
42. Bourne A, Reid D, Hickson F, Torres S, Weatherburn RP. The Chemsex Study: drug use in sexual settings among gay and bisexual men in Lambeth, Southwark & Lewisham. *London Sch. London*;

2014.

43. Thomas N, van de Ven K, Mulrooney KJD. The impact of rurality on opioid-related harms: A systematic review of qualitative research. *Int J Drug Policy*. 2019;In press.
44. Barocas JA, Brennan MB, Hull SJ, Stokes S, Fangman JJ, Westergaard RP. Barriers and facilitators of hepatitis C screening among people who inject drugs: a multi-city, mixed-methods study. *Harm Reduct J*. 2014;11:1.
45. Berends L. The emergence of a specialist role in rural alcohol and drug service delivery: Lessons from a review in rural Victoria, Australia. *Drugs Educ Prev Policy*. 2010;17:603–17.
46. Neale J, Tompkins C, Sheard L. Barriers to accessing generic health and social care services: a qualitative study of injecting drug users. *Health Soc Care Community*. 2007;16:147–54.
47. Neale J, sheard L, Tompkins CN. Factors that help injecting drug users to access and benefit from services: A qualitative study. *Subst Abuse Treat Prev Policy*. 2007;2:31.
48. Liu S. A Precarious Rite of Passage in Postreform China: *Med Anthropol Q*. 2011;25:395–411.
49. Beckerleg SE, Hundt GL. The characteristics and recent growth of heroin injecting in a Kenyan coastal town. *Addict Res Theory*. Taylor & Francis; 2004;12:41–53.
50. Mojtahedzadeh V, Razani N, Malekinejad M, Vazirian M, Shoae S, Saberi Zafarghandi MB, et al. Injection drug use in rural Iran: Integrating HIV prevention into Iran's rural primary health care system. *AIDS Behav*. 2008;12.
51. Payne J. Women drug users in North Cumbria: What influences initiation into heroin in this non-urban setting? *Sociol Heal Illn*. 2007;29:633–55.
52. Smith C. Injecting Drug Use and the Performance of Rural Femininity: An Ethnographic Study of Female Injecting Drug Users in Rural North Wales. *Crit Criminol*. 2014;22:511–25.
53. Le P-P, Hotham ED. Exploring the dissonance between business and public health policy: pharmacy and the provision of opioid pharmacotherapies and clean needles in rural settings. *Int J Pharm Pract*. 2006;14:63–70.
54. Allen ST, Grieb SM, O'Rourke A, Yoder R, Planchet E, White RH, et al. Understanding the public health consequences of suspending a rural syringe services program: A qualitative study of the experiences of people who inject drugs. *Harm Reduct J*. *Harm Reduction Journal*; 2019;16:1–10.

## Tables

**Table 1:** Slopes and their associated 95% CI of the linear model fitted between PWUD benefiting from the program each year and the time since the beginning of the program.

	Slope (PWUD / 100,000 Habitants)	95%CI
Zone density 1	0.08	0.06 - 0.10
Zone density 2	0.05	0.04 - 0.06
Zone density 3	0.05	0.03 - 0.07
Zone density 4	0.07	0.04 - 0.09
TOTAL	0.06	0.05 - 0.08

Due to technical limitations, Table 2 is only available as a download in the supplementary files.

## Figures

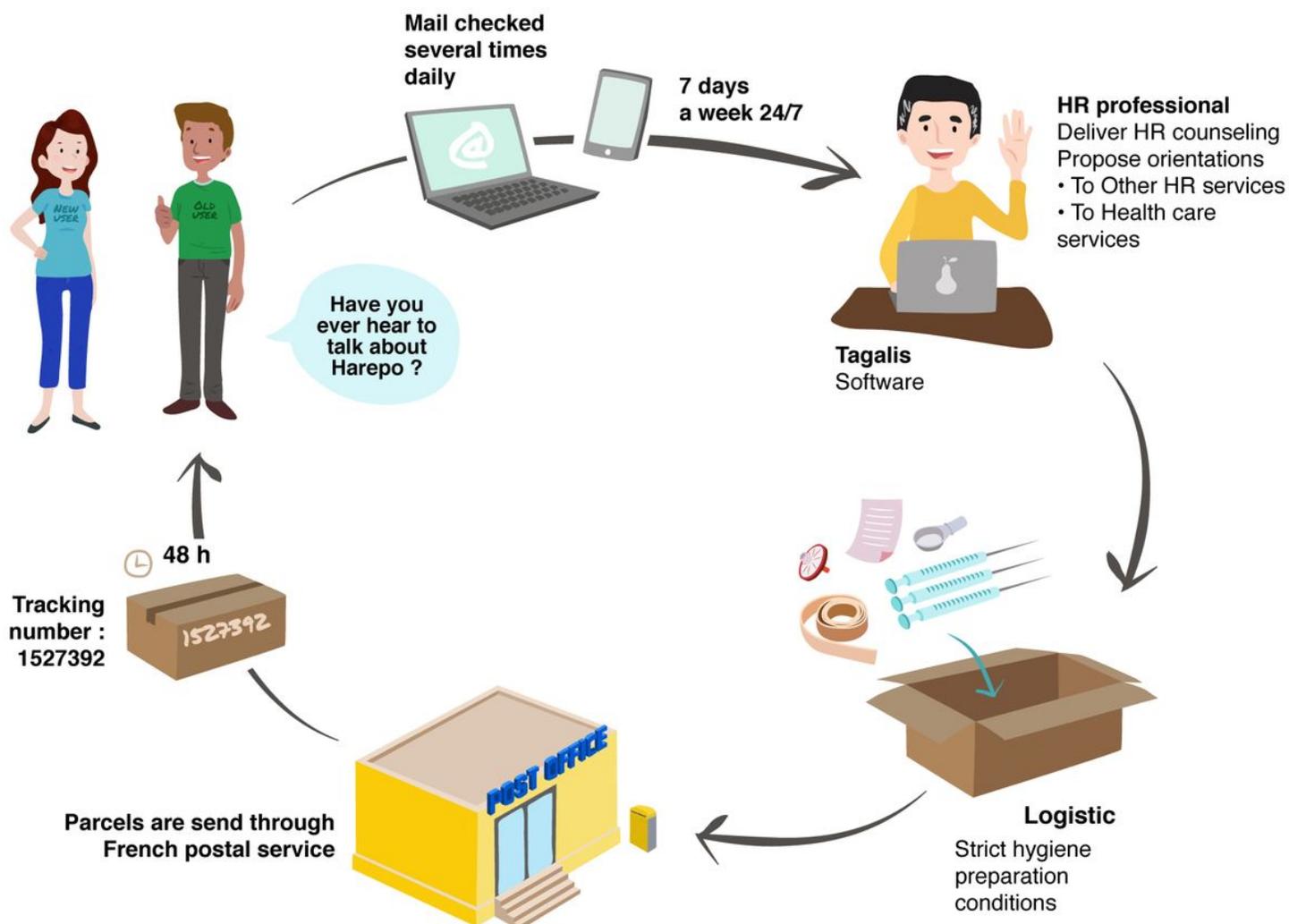


Figure 1

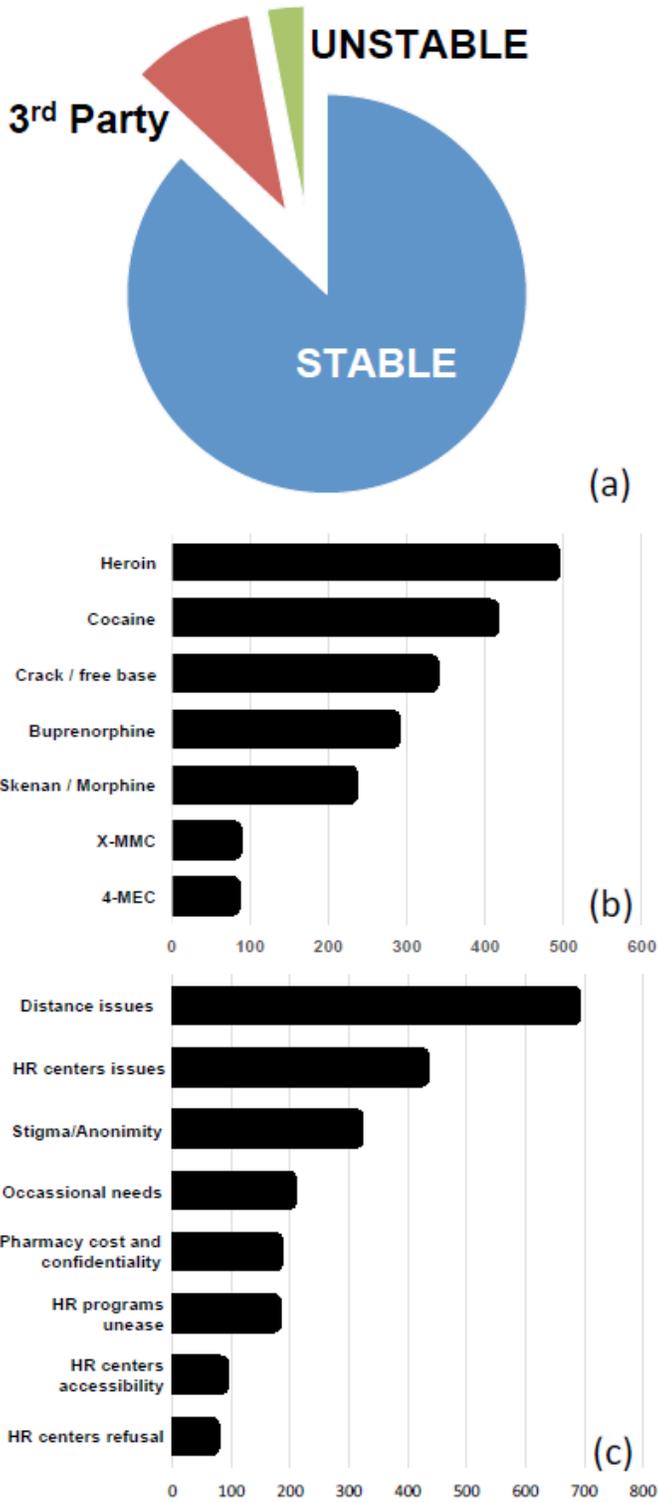


Figure 2

Accommodation of PWUD benefiting from HaRePo (a). Consumers consummation profile (b). Consumer motivations to join HaRePo (c).

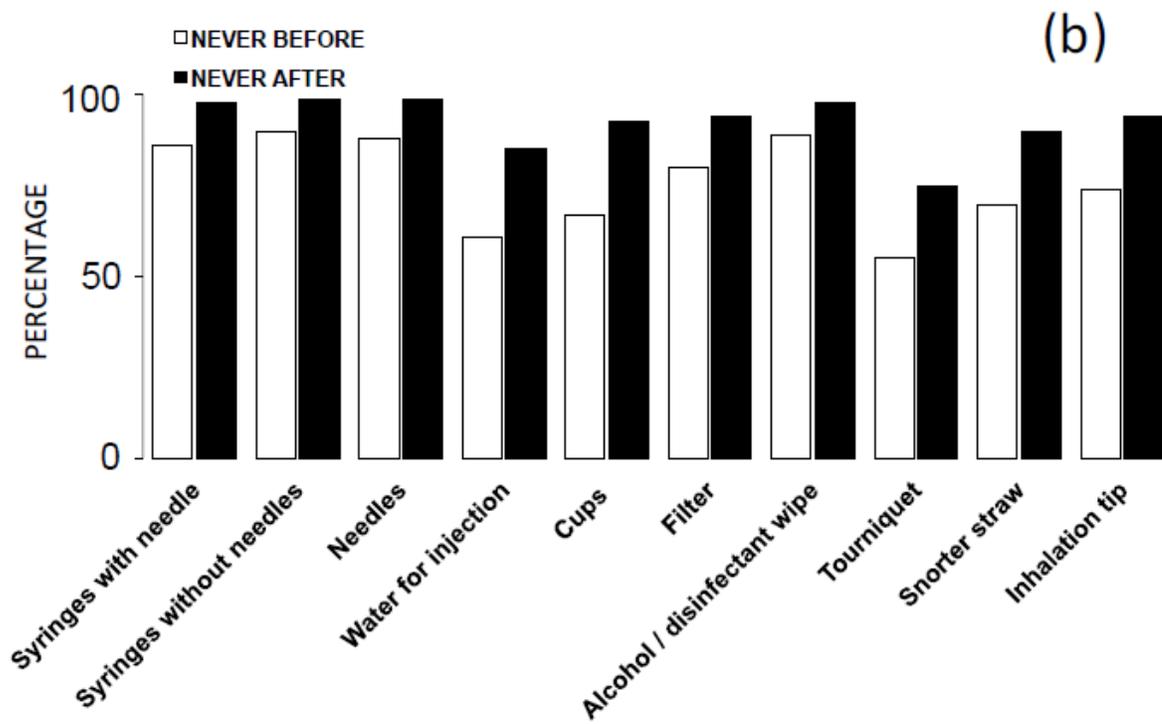
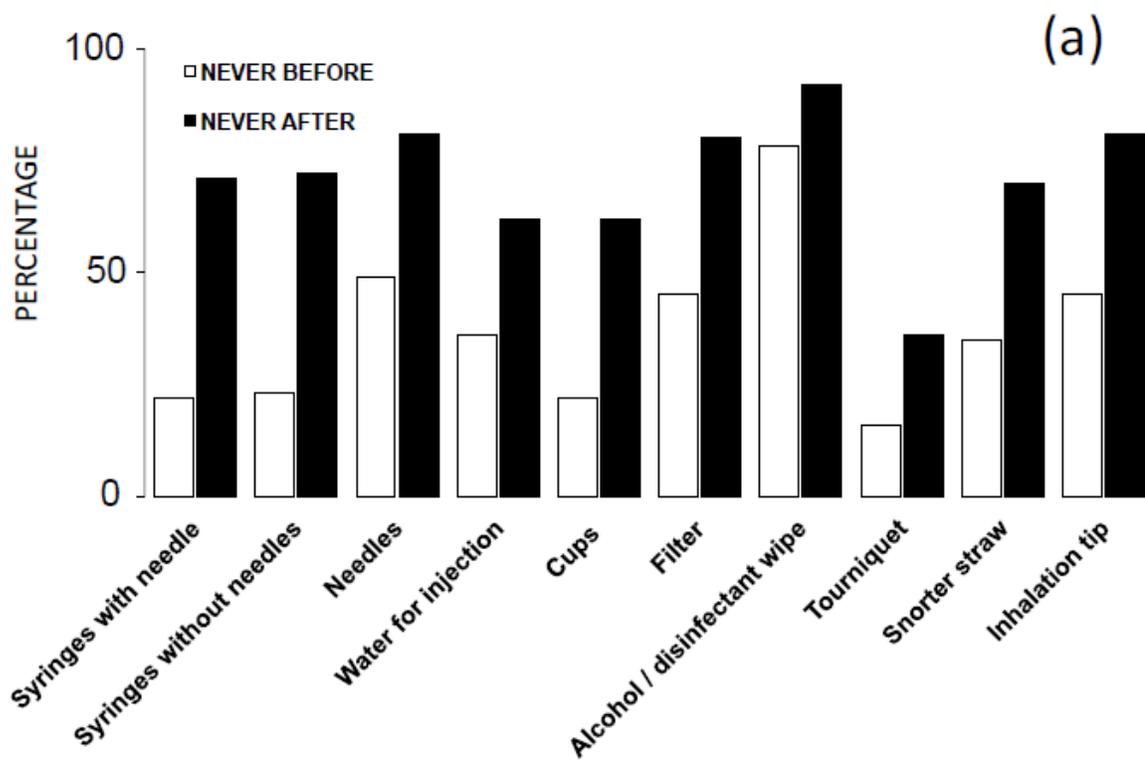
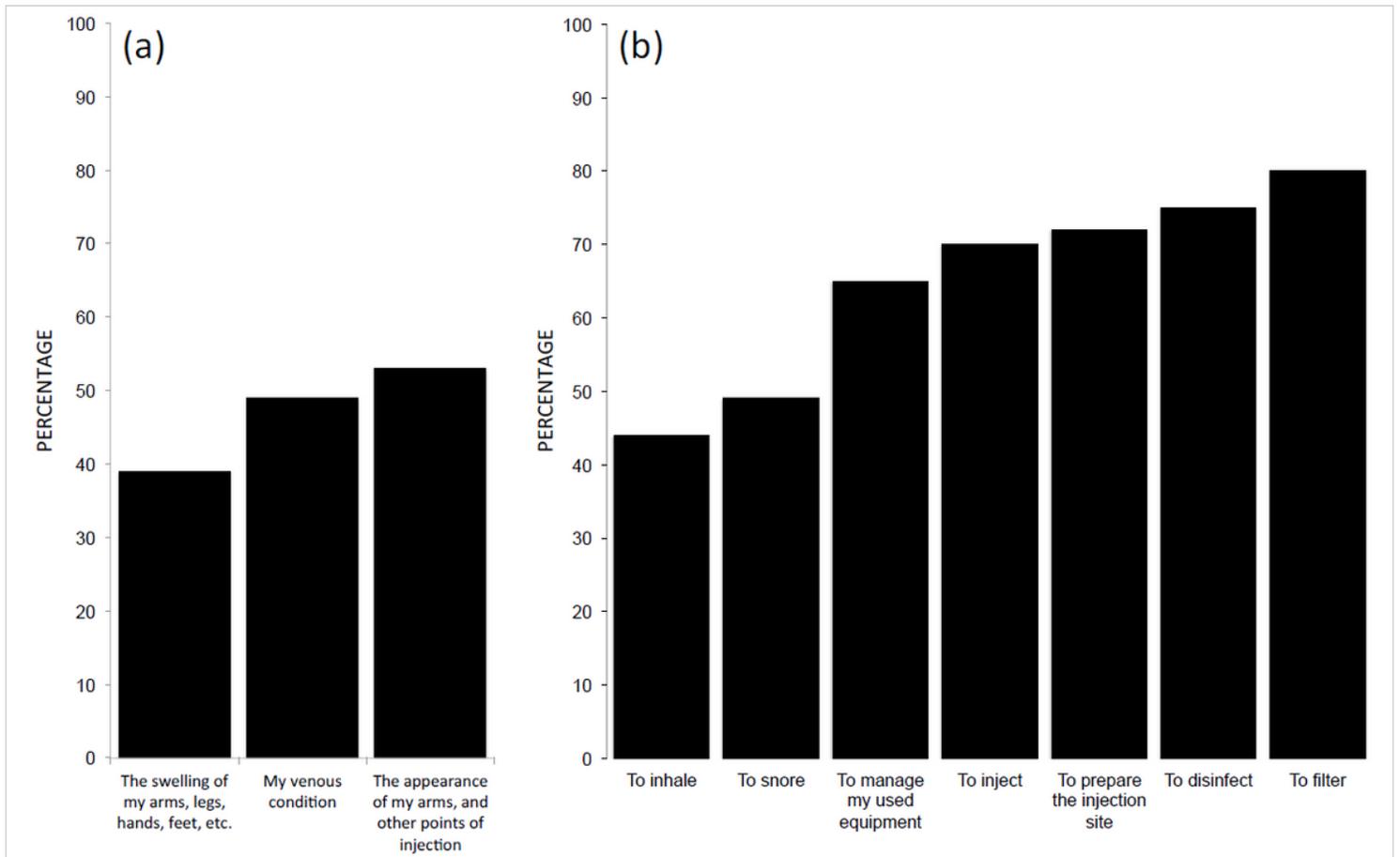


Figure 3

Impact of the program on tools reuse (a) and sharing (b).



**Figure 4**

Effect of the program on PWUD perception of their own health status (a), and effect of the program on safety improvement of PWUD consumption practices (b).

## Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [HRtoolslistprovidedbyHaRePo.xlsx](#)
- [Supplementaryfigures.doc](#)
- [Table2.docx](#)