Drug Checking on Vesterbro

A pilot project at the Men’s Home

“Harm Reduction Through Knowledge”
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1. Preface

This report presents the experiences from a one-year pilot project where Mændenes Hjem (the Men’s Home) have developed a procedure for testing illegal drugs for the users of the drug consumption room (DCR) SKYEN. The project has shown that there is a big potential in offering a test of illegal drugs for the most vulnerable citizens. The users have shown great interest in the checking service and they have been very attentive towards the harm reduction dialogue that has been part of the service. Besides the positive experiences in relation to the drug users, the project has given us a unique and up-to-date knowledge of the drugs currently used in the open drug scene of Copenhagen.

We are very pleased that the collected experiences and knowledge from the pilot project have been implemented meaning that the Men’s Home can now offer drug checking to the users on a daily basis.

The Men’s Home would thank Helsefonden and OAK Foundation Denmark very much for the financial support of the project. Besides the aforementioned, the support from these foundations have allowed us to gain a very unique insight into an underexposed area of the Danish and international harm reduction work.

A special thank you to the external sparring group that has contributed significantly to the progress and results of the project.

A very big thank you should also be given to the staff of SKYEN and the leader of the Men’s Home’s health department, Michael Freudendal-Pedersen. Your support, commitment and professionalism has meant the world for the project’s success.

Last but definitely not least, a big thank you to the users who have had their drugs checked. Without your interest for the project and your willingness to provide samples for testing, the project would never have been realised.

It is our hope that the results of this project will benefit you and all other drug users.

A very special thank you to Kim Gosmer, project leader, who with his width, engagement and focus has done what we did not think was possible prior to project launch. Besides having the responsibility for executing and implementing the project, Kim has also written this report which is also a testimony of a special integrity and a very high level of professionalism.

Ivan Christensen, director Men’s Home
2. Abstract

From February 2017 till March 2018, the Men’s Home in Copenhagen conducted a pilot project, to gain experience with running an anonymous drug checking service. It was the first ever official Danish drug checking project, as well as the world’s first ever drug checking project, that has been connected to a drug consumption room.

The main goal of the project has been to collect knowledge of the drug market surrounding the drug consumption room SKYEN, thereby strengthening the professional basis for the staff’s relational and harm reduction work with the users.

For the analysis of the drugs, a Bruker Alpha FTIR-system was used. The system is both robust and user friendly and was well suited for the project's purpose. In most cases, the analytical results’ level of detail was sufficient for the staff to evaluate the composition of a given sample. With the limited resources of the project it was not possible to make a verified method for quantification of cocaine and heroin, unfortunately.

The project’s protocol is approved by the legal department of Copenhagen’s Police and with their permission, the daily staff has been trained in performing drug checks. This was crucial for the project’s success, since the availability of the drug checking service was significantly improved, and it also brought the staff/user-relations more into play. As the project period ended, drug checking became an integrated part of the everyday life in the drug consumption room.

Over a period of 10 months the project analyzed 306 samples submitted by 122 unique users. Most of the samples (73%) were cocaine and the majority of these (77%) were of very high purity with no additives detected in them. One of the samples was determined by external analysis to contain 95% cocaine. The only common cutting agent in cocaine was the carcinogenic and nephrotoxic compound phenacetin (found in 17% of the cocaine samples). Prior to the drug checking project phenacetin was neither known by users nor staff. 11% of the submitted samples were brown heroin and in almost all of these, varying levels of caffeine and paracetamol were found as well as a low content of heroin. White heroin constituted 10% of the submitted samples and again, caffeine and paracetamol were the most common cutting agents. The heroin content was generally higher but with larger variations between samples than for the brown heroin samples.

The pilot project has given valuable and relevant insights into the drug situation of Vesterbro, as well the users’ drug habits. Drug checking was proven to be a good and very tangible approach to strengthen the staff’s harm reduction work with the users and has thereby brought new perspectives to the work with vulnerable drug users.
3. Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>DCR</td>
<td>Drug Consumption Room</td>
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<tr>
<td>FTIR</td>
<td>Fourier-Transformed Infrared Spectroscopy</td>
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<tr>
<td>HPLC</td>
<td>High Pressure Liquid Chromatography</td>
</tr>
<tr>
<td>IR</td>
<td>Infrared Spectroscopy</td>
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<td>MA</td>
<td>Mixture Analysis</td>
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<td>MH</td>
<td>Men’s Home</td>
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4. Sparring Groups

Internal work committee at Men’s Home:

Ivan Christensen, Director
Michael Freudendal-Petersen, Leader of Health Department
Kim Blauenfeldt Gosmer, Project Leader

In extent of the internal work committee, the project has also been associated with an external sparring group, represented by a series of local stake holders and professionals. The purpose of this group was to ensure a high level of expertise and relevance of the project.

The external sparring group:

Municipality of Copenhagen, Centre for Vulnerable Adults and Families (Chief Physician Henrik Thiesen)
Danish Poison Control Hotline (Chief Physician Søren Bøgevig and Chief Physician Dorte Fris Palmqvist)
Copenhagen Police (Local Officer Rud Ellegaard)
Street Lawyers (Coordinator Filip Soos)

The Users’ Academy (Board Member Sune Kehlet)

5. Background

An illegal and thereby unregulated drug market equals a risky and uncertain living for drug users, whether the use is recreative or on a daily basis. Most are left to the drug traders’ mercy, lack of knowledge and/or cynicism and almost every single drug scene is marred by resilient myths and homegrown theories about the composition of illegal drugs. In short: There is a lack of relevant, accessible and honest knowledge on the drug scene and this is where an anonymous drug checking program has an enormous potential to do a difference.

Checking illegal drugs to monitor the drug market and giving harm reduction guidance to users is not a new phenomenon. In the Netherlands it has for more than 25 years been possible to hand in drugs for analysis and today there are at least 23 drug checking initiatives\(^1\) and more are launched every year.

Denmark has, with DCRs, heroin clinics and courses in overdose treatment/Naloxone, a good tradition of being progressive in terms of harm reduction initiatives on the open drug scene. Examining the possibility to offer anonymous testing of illegal drugs was therefore an obvious next level initiative.

A common denominator for the European drug checking services is however that they primarily address the recreative and the nightlife drug scene. There is currently no Danish drug checking know-how available nor international evidence from the open drug scene, and on this basis, it was decided to do a drug checking pilot project at the Men’s Home in Copenhagen.

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\(^1\) “Global review of drug checking services operating in 2017”
6. Project Goals

The primary goal of the pilot project has been to gain experience with offering a drug checking service in a DCR. A secondary goal was to gather information of the drug situation on Vesterbro, more specifically in the milieu around Men’s Home and the DCR SKYEN. The collected knowledge can hopefully provide a better base for the relational and harm reduction work with the drug users on Vesterbro.

Hitherto, the evaluation of the drug situation has been based on reports and assumptions of users and staff meaning that it has been pervaded by speculations and urban legends about the composition of drugs, hereunder purity and adulterants. The only available and true knowledge about the composition and the tendencies hereof, has been two annual reports from the Danish Health Authorities\(^2\) and the three departments of forensic medicine\(^3\) in Denmark. By the end of the pilot project ultimo March 2018, the newest available reports were based on police seizures done in 2016 and the relevance of these for the daily life of drug users are therefore very limited. Besides being outdated in regard to staff and user needs, the number of data points for each type of drug in these reports are very limited. As an example, “Narkotika på Gadeplan 2016” only included 44 cocaine samples, four samples of brown heroin (heroin base), one amphetamine and no samples of white heroin (heroin chloride) in the statistics from Copenhagen. Dutch experiences\(^4\) have shown that drug checking based on user submitted samples can give a significantly larger data set and a more real-time and thus a more relevant insight into the tendencies of a current drug market. A main purpose of the pilot project at Men’s Home has therefore been to collect enough data to allow a more relevant and thereby useful snapshot of the local illegal drug market than the beforementioned reports.

A lessor, more practical sub goal of the pilot project was to clarify whether it is safe to offer drug checking in a milieu where traders and masterminds might not have an interest in user insight in drug quality and composition. The safety question has been a paramount criterion of success for both Men’s Home and the Copenhagen Police.

Another very relevant question has been to find out if the users were at all interested in submitting some of their hard-earned drug, as it could not be returned after analysis\(^5\). Herein lies a major difference compared with other known drug checking services as it is expected that recreative users have a bigger mental surplus to hand over a subset of their drug than daily users that are dependent on their drug and often has been through a lot to finance it. If the analytical results and the appertaining conversation does not have an adequate value for the users, the project would die a quiet death in lack of samples. An unfortunate consequence of this necessary framework will probably mean that the most vulnerable users do not have the surplus to have their drug tested. A criterion of success for the project is therefore a continuous flow of samples and new users throughout the project period.

A third focal point during the project period has been to look at the users’ pre-evaluation of drug quality and constitution before the test results are revealed. This is a very difficult parameter to conclude anything from as the users’ guesses will probably be a mixture of expectations, hopes and experience but nonetheless it is interesting to see if there is any accordance between analyses and guesses.

A fourth and very essential question for the project was to find out if the test results allowed the staff to engage a constructive dialogue with the users about dose, habits of consumption, adulterants, side

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\(^2\) “Narkotikasituationen i Danmark 2017”

\(^3\) “Narkotika på Gadeplan 2016”

\(^4\) Drugs Information and Monitoring System, “Annual Report 2016”

\(^5\) This was a demand from the legal department of Copenhagen Police.
effects etc. That is, if the users find the information and guidance useful and if so, do they change their drug habits based on the information?

The fifth and final main question of the project was to examine whether the test results could be useful from a health professional perspective when examining their health conditions and thereby also the according treatment strategies. In this question lies an obvious barrier as the drug checking service is anonymous. This means that test results cannot be correlated with a medical journal without consent of the user.

As mentioned, this is the first ever drug checking project on Danish soil and, to the best of our knowledge, the first ever drug checking project in the world that targets the open drug scene. Every observation and gained experience is therefore of high value.

7. Analytical Method and Hardware

Key parameters of a well-suited analytical setup for a project as this are stability, ease-of-use for non-specialized personnel, low price (both acquisition, during operations and maintenance) and of course, an adequate level of information on samples even if they contain multiple compounds.

Three different analytical techniques have been considered for the project. The original plan, prior to project launch, was to use simple chemical test, also known as colorimetric tests, to identify compounds and establish purity. These tests are cheap and very easy to perform but they also come with several drawbacks. One major problem is the use of toxic reagents that require special waste management, detailed safety protocols and a fume hood, and furthermore, the results can be very difficult to interpret correctly if the tested compound is not a pure substance. This means that drug mixtures will produce ambiguous and, in most cases, useless results. Even if a drug is completely pure, the colorimetric tests can only be used as a method of exclusion (falsification) and not for direct identification (verification). This means that it is impossible to verify that a sample does not contain two different compounds that give the same or a similar color reaction.

Another possible technique was Raman spectroscopy. This technique is fast (< 1 minute), easy to use and the price tag was within the project’s budget. An advantage of this method is that it is possible to measure directly on a sample and even through clear packaging such as glass or plastic meaning that direct contact with the drug is avoidable. Another intriguing advantage is that it would not be necessary for the users to hand over a non-refundable subset of their sample to the staff.

Raman systems are also portable, and the technique is therefore also widely used by Danish Customs Agency for identification of unknown powders and liquids. A demonstration of a handheld system (BW Tek TACTIC ID-N) did however reveal two obvious problems. First – Raman spectroscopy uses a class 3 laser meaning that it requires suitable eye protection during use. This could be handled but depending on the sample type, the laser must be adjusted in strength and if this is done improperly or forgotten, the sample might be destroyed. Should this happen to a user sample it is expected to cause frustration and future mistrust to the project which is unacceptable. Second – some sample types, such as heroin, must be dissolved in acetone wherein a special test-stripe is dipped and subsequently analyzed. Raman spectroscopy would therefore require consumables (=increased costs) and pose a problem due to the use of solvents (ventilation, safety and waste).
The third and chosen technique is Fourier-transformed infrared spectroscopy (FTIR). It is, like Raman spectroscopy, a laser technique but as it is based on a class 1 laser, there is no risk for neither people nor drugs. The system can also analyze all sample types without the need for pricy consumables, giving it a clear advantage compared with the Raman system. Furthermore, FTIR is already used with great success by the British NGO The Loop⁶ that does drug checking at British festivals. During project start-up, we had contact with the Guy Jones, senior chemist at The Loop, and his recommendations combined with the mentioned advantages (FTIR vs. Raman), made it easy to choose our setup - a Bruker Alpha Platinum Attenuated Total Reflectance FTIR-system (see picture 1).

Amongst the obvious advantages of this system is its robustness, ease of use and the minimum requirements for maintenance. Furthermore, FTIR can, if the system I calibrated with samples of known concentration, also be used for quantitative analysis (purity test). The primary disadvantage of FTIR is a rather high detection limit compared with more advanced techniques such as liquid and gas chromatography. This means that more than 5-10% of a given compound should be present in a mixture before the FTIR-system can detect and thus identify it.

To do qualitative analysis (identification), a database of relevant IR-spectra is necessary. For the pilot project, two databases were acquired – “TICTAC” which is a small but focused database of illegal drugs and known adulterants, and “ATR-FTIR Complete” which is a larger and broader database. With these two search libraries it is possible to identify more than 27.000 different compounds.

The software for the FTIR-system, OPUS, has two different search algorithms. The standard search identifies single components using the search libraries and ranks them with a hit quality between 0 and 1000, where 1000 is a perfect match. It is important to note that this number is not directly correlated with purity. A hit quality of 973 on cocaine (see picture 2 and appendix A) does not equal a purity of 97.3% but it is still indicative of a high purity sample and the sample is of higher purity than one with a hit of 900. A hit quality below 950 is typically

⁶ WeAreTheLoop.org
indicating a sample that contain more than one compound (such as an adulterated sample).

OPUS also has an advanced search algorithm, Mixture Analysis (MA), which is a strong tool in case of a multi-component sample. The algorithm searches the chosen databases for an optimal ratio of two or more spectra that combined provides a better match than a single database entry. This function is not validated in regard to the exact ratios, but it is a very useful tool for both experienced and non-specialized personnel (see picture 3 and appendix B).

More precise, but also much more expensive, solutions than FTIR exist but for a relatively small and limited pilot project such as this, it was neither economically nor practically possible to build a liquid or gas chromatographic laboratory. It is also worth noting that the customer segment is typically living a rather rough life with very little surplus in the daily life meaning that a very short time of analysis is an important parameter. Here, FTIR has a clear advantage compared with the more sophisticated solutions - a full analysis and interpretation can be done in less than five minutes, where HPLC/GC typically has a response time of 30+ minutes. HPLC and GC also requires specialized personnel (laboratory technician/chemist), expensive consumables, frequent maintenance and, well, a proper laboratory setup to work properly meaning that it is a very inconvenient solution for a DCR.

Picture 2: An example of a cocaine sample with a hit quality of 753, indicating two or more components. This can visually be confirmed as the recorded spectrum (red) and the database spectrum of cocaine (blue) does not match. The search algorithm Mixture Analysis can be used to identify the remaining components. See appendix B.

Picture 3: An example of a cocaine sample with high hit quality (973) and thereby also high purity. Visually there is also a good correlation between the recorded spectrum (red) and the database spectrum of cocaine (blue). See appendix A for larger version.
8. Protocol and User Agreement

For the drug checking project to become a reality it was necessary with a permission to receive and handle illegal drugs for analysis. Through the local police on Vesterbro, a contact to the Legal Department at Copenhagen Police was established and in collaboration with these, a protocol for the projects testing procedure was composed. The final and approved protocol is attached as appendix C.

In the protocol, the target group for the project were defined as “strongly addicted users with a longer and sustained abuse of illegal drugs” – the same target group as that of the DCRs of Vesterbro.

An essential point in obtaining the permission by Copenhagen Police was that only small amounts of drug was collected from the users and that the samples were disposed of after analysis. According to §1.3 in “Law on illegal drugs” it is written that “… import and export, sale, acquisition, extradition, receiving, manufacture, processing and possession of such (illegal) drugs are prohibited”. However, the judicial concept material atypicity makes it possible to receive and possess illegal drugs if it is without a final intent of consumption. So, because acquisition and handling of the drugs are with the purpose of analysis and subsequent destruction, the acts fall outside the aims of law on illegal drugs. Another crucial aspect of the permission has been that there must be no instigation to drug consumption nor must a drug be labeled as safe to use based on the analytical results.

When a user wishes to use the drug checking service for the first time, a user agreement with conditions for analysis must be signed prior to submission of a sample. Important points in this agreement include an obligation to inform that the submitted drug is not returned, that the test is only instructional, and that every consumption of drugs is the user’s own responsibility, even if the drug has been checked. The user agreement is both available in Danish and English (See appendix D).

According to the agreement with the Legal Department, the permanent employees trained in the drug checking procedure are allowed to receive, handle and possess samples of illegal drugs submitted for drug checking in the area that is covered by the partnership agreement between the Municipality of Copenhagen and Copenhagen Police regarding DCRs, provided that the samples are destroyed after analysis. Kim Gosmer, who has been leading the project, is in the future also covered by the same agreement as he will continuously be affiliated as external support on the drug checking at Men’s Home.
9. Results and Discussion

This section seeks to answer the five primary questions and discusses relevant experiences, observations and practical aspects in offering a drug checking service in a DCR. Additionally, the analytical results from the FTIR-analyses of submitted samples are summarized. The discussion hereof is considered as the evaluation of the drug situation on Vesterbro during the project period.

Regarding this project evaluation it is important to emphasize that this has been a pilot project rated at only 15 hours per week for a period of 13 months. It has therefore been necessary to prioritize the focus areas and here, setting up the hard-/software, training staff and implementing drug checking as common practice was prioritized higher than a structured data collection and evaluation of questionnaires and interviews. Due to this prioritization, the evaluation of the effect of drug checking and the appertaining harm reduction conversation on users’ drug habits has a semi-qualitative character. A full qualitative/quantitative study of the effects would be both very time consuming and a disproportionately large expenditure considering the project’s scope.

The five questions

The safety question regarding a drug checking service in an open drug scene as the one on Vesterbro was as mentioned crucial for the project. Originally, the plan was that in the early phase, only residents of Men’s Home could use the service and that these could come by the office and be present during the analysis. As this resulted in very few submitted samples, the procedure was shortly after changed so that all users in the target group could submit samples by contacting a staff member from Men’s Home or SKYEN. A sample was then submitted and subsequently analyzed without the user being present. This solution was both practical, resulted in a significant increase in submitted samples, expanded the user base and it also significantly reduced the safety concerns. As the first half of the testing period ended, the project had only received positive feedback and it was therefore decided to move the service to an office adjoining the DCR to get closer to the users. Out of opening hours, the system was shut down and moved to a more secure location. Besides a closer contact with the users, moving the service significantly reduced the response time and it increased the involvement of the staff in the project. At the end of the project period, there had still not been any safety issues with neither users, traders nor people from higher up the supply chain. It should be noted that the safety evaluation of course is an ongoing process.

A sometimes chaotic and economically challenged life combined with drug dependency means that the target group of the pilot project cannot be expected to have the mental surplus, mood nor possibility to submit even a small amount of drug for testing, especially not when they know that the sample is not returned after analysis. The work group was aware of this from the beginning and knew that it would probably mean that some users would not use the service. This is problematic as especially the more vulnerable users are expected to be more venturesous in terms of choosing drug/trader which means that they could benefit the most from a drug check.

To address this issue, a dummy sample was made in a small plastic cup to visualize the very small amount of drug needed for the analysis. This was a simple yet very efficient tool to convince the users that the “price” for a drug check was very limited. Another good experience has been to reach out and inform the users directly to explain what information and guidance can be given based on a submitted sample. Most users who submitted samples have been injection users. This is probably due to the constant presence of personnel in the injection room (the smoking room is unattended) and it has therefore been
easier to small talk about drug checking and thereby to raise interest. Two very significant parameters for the success of the drug checking project has therefore been the equipment’s proximity to the DCR and the good relations between staff and users.

One of the major questions has been whether the users felt they got enough value-for-drug when submitting a sample for a drug check. In general, many users have expressed their satisfaction with the service and the level of available information and the majority found it a modest price to pay in exchange for a bit of certainty and insight into their drug composition. Several times, users were so happy for their test results (in case of higher purity than expected) that one could argue that the joy of the drug check dwarfed the potential euphoria of the submitted sample.

There was, however a large group of users that were not interested in the drug checking service. Typical reasons were “well, I’m going to take the drug no matter the result”, “I trust my supplier and know his/her quality” and “my friend has already submitted a sample and I bought the same as him”. All three arguments are valid and understandable reasons for not submitting a sample and some users have therefore been very hard to reach during the project period. However, the users are well aware that many traders have a good and a bad pocket meaning that the quality of two bullets from the same supplier can be significantly different. They also know that just because a supplier has a good quality today it does not mean that it is the case tomorrow. In other words: There are still good reasons to test so the hope is that when the drug checking service becomes a more integrated part of the daily life in the DCR, these users can be reached as well.

On the other hand, many users have been very curious and positive on the project and they have been very interested in finally getting a clear answer to the questions and hypotheses regarding the drugs that take up such a large part of their life. At some point, every single user in the milieu have had a drug in hand that did not have the same appearance or effect as expected, everyone has heard a trader say “my drug is the best on the street” and everyone have been in the situation that their usual supplier were nowhere to be found and thus have had to buy from an unknown. In each of these cases, drug checking could deliver an objective evaluation and no matter the result, the users have been happy with the clarification and the following possibility to make decisions on an informed basis.

There have been several examples during the project period where a user has brought in the remainder of a bullet after an atypical drug experience. Examples hereof are when a drug simply did not provide any effect, when an unexpected residue remained after dissolution or that an unexpected side effect had occurred. For instance, a user one day submitted a sample of cocaine as she the day before had collapsed after taking the drug. When asked about the dose she replied that she had taken a full bullet (between 150-250 mg) - she suspected the drug to be adulterated and that this was the cause of her unexpected reaction. The test showed that it was cocaine of very high purity and that no adulterants were present. The following conversation focused on the high purity of cocaine currently seen on the street (and all over Denmark) and she was therefore advised to lower the dose significantly – maximum half a bullet and preferably on a third. This is far from the only example where users have expected a diluted or adulterated sample and the test indicated very high purity.

A general observation in relation to IV-dosing of high purity cocaine has been that most users, whatever their frequency of use, seem to have the best experience with doses below 100 mg, typically in the range around 70-80 mg. At this dose, the users are still easy to communicate with, they are in good mood, appear coherent and they want to socialize. At higher doses, especially above 150 mg, it is obvious that the side effects increase. Heavy perspiration is seen in the face, pupils are highly dilated, conversations are difficult as they
constantly lose focus and there is a higher tendency towards psychotic behavior. The purpose of intoxication is of course very different between users and the border-seeking behavior is also more evident in some but the results from the project has in many cases been a good starting point in talking dose versus wanted effect with users.

One of the projects returning visitors was a user with surplus to buy larger quantities at an out-of-town trader. This meant that he did not have to buy on the street and he completely avoided the daily stress of always having to find the next fix. Because he had a good relationship with his supplier, it was possible for him to get free samples for drug checking and based on the results, he could choose the batch he wanted to buy from. At one point, he brought in a sample that should have been white heroin – the analysis could however not identify neither heroin nor any other known additives and as he tried to dissolve the sample it did not behave as expected (hazy with heavy precipitation). This was obviously not a batch he wanted to buy from and he later told that the supplier had decided to flush the entire batch based on the results. The possibility to use drug checking to pressure higher levels of the supply chain is not an insignificant perspective. From the Netherlands there has also been examples that ecstasy pills with unexpected and/or unwanted content have disappeared completely from the market after a drug check, both because traders have chosen to dispose dangerous pills but also because users have bought a batch with the intent of removing it from the market.

During the project period it also became obvious that some traders consistently sold cocaine containing the adulterant phenacetin. Through conversations with users it was told that he presumably did not mix the drugs himself but that he received it “ready to sell”. He was fully aware that his cocaine was diluted but he had no idea that it was adulterated with a pharmaceutical compound with serious side effects. He also told that he was not going to stop selling dilute cocaine because there is a good market for cheap cocaine on the street, but as he did not want to harm neither business, customers nor himself (he used his own cocaine), he was curious to find an alternative cutting agent. Through a user, the trader was handed a note with information on phenacetin and its known side effects along with an alternative cutting agent (lactose, as it is inactive, water soluble and accessible) and he promised to bring the message higher up in the supply chain. This is of course no guarantee that phenacetin is now going to disappear from Vesterbro cocaine but it does however show that it is possible to have a constructive dialogue with the drug traders and that drug checking has a potential to change the drug market.

Table 1 shows the distribution of submitted samples amongst the 122 unique users that had their drug analyzed during the project period. 66% of the users only submitted one sample for testing while a smaller group of users, 4%, have been frequent users of the service.

Table 1: Distribution of submitted samples per user during the project period

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<th>Samples per user</th>
<th>Amount</th>
<th>Percent</th>
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<tbody>
<tr>
<td>1</td>
<td>80</td>
<td>66</td>
</tr>
<tr>
<td>2-5</td>
<td>35</td>
<td>29</td>
</tr>
<tr>
<td>6-10</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>10+</td>
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As such, the majority of users only submitted one sample for analysis. This is probably due to several reasons, one being that the users have

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not felt that they got enough value out of it or that they submitted a sample due to the news value of the project. In general, there has been a good response regarding the level of information from the service and, hopefully, as the staff gets more and more experience and thus confidence with the procedures, some of these users will return with more samples. Another feasible explanation is that there is a large turnover in the user group – many users that were frequently using SKYEN when the project was launched, were not part of the milieu as the project period ended.

Towards the end of the project it has been a tendency that more users have returned to use the drug checking service (see figure 1). This is ascribed three factors. One – the users have had to get use to drug checking as a possible service at SKYEN and that they can trust the results. Second, the opening hours have increased during the project period as more and more people have been trained in the procedures and it has therefore become easier for the users to submit samples when they had the surplus instead of being referred to a specific opening hour/day. From November, everyone from the daily staff were trained in drug checking but due to safety concerns, the equipment was packed up and removed every night. This gave a lot of extra down-time as the equipment was often not set up the following morning due to busy schedules. Since February, the equipment was firmly secured to a table and this solution has significantly increased the availability of the service and the opening hours has since then followed those of SKYEN. The third factor is, as mentioned above, that the staff has become more and more confident in doing both analyses and harm reduction conversations. One could say that a continuous flow of both samples and new users should reflect the relevance of the project and thereby also its success – if the users do not feel they get enough out of handing over some their drug they would most definitely keep it for consumption instead.

A lot of the users are drug nerds – they know a lot, have thought very carefully about the preparation and method of intake, how it should look, feel and taste, and most important, how the effect should feel when everything is absolutely right. Before the test results are communicated, a question to the user has been what his or her expectations to the drug was. There has been distinguished between samples analyzed before or after the user has used the drug.
A common method for the users to evaluate cocaine quality on the street is to dissolve it in water – the faster it dissolves, the better, and the water must remain clear without any precipitation. As cocaine dissolves, the solvents used during production are released and the smell of these are also used in the quality estimate. Visually, shiny flakes are an indication of good quality – powder is rarely a good thing as it can be a tell-tale of dilution/adulteration. With parameters such as these, it is relatively easy for users to estimate the quality of cocaine and even though the methods are simple and without guarantees, they are still good indicators. Throughout the project, there were some bad estimates but in general, the correlation between user estimates of cocaine quality and the drug checking results were quite good.

Neither brown nor white heroin has a characteristic look or a special scent at high purity\(^9\) and the lack of such a characteristic makes it more difficult for the users to evaluate the drug before consumption and thus it is also more difficult to dose correctly. Unfortunately, it was not possible to obtain a strong heroin quantification method during the project period (see later) but when such a method is developed, the harm reduction potential of the drug checking service will increase significantly. In general, the users’ expectations of submitted brown heroin were quite low but still, many were shocked to hear that their drug was approximately 10-20% pure.

One of the core questions of the project has been if the test results could provide a new way to start a fruitful dialogue with the users about their drug related habits and considerations, and to get them updated on the local drug situation. Especially the fact that the conversations have been based on results from their own drugs made it more relevant and made it a lot easier for them to relate to than if they were provided with general statistics. During the project period, many users have also asked a wide variety of drug related questions. One of the most common was whether synthetic cocaine is seen on the street – an obdurate question and the clear answer has been no. Cocaine is a way to complex molecule to synthesize at a reasonable cost. Cocaine-like research chemicals exist but these are very uncommon and are more a thing in more experimental drug environments. Another common question has been whether methamphetamine is seen as a cutting agent in cocaine. This rumor is probably based on the fact that the purity of cocaine has been on the rise in Denmark during recent years and that users have not lowered their doses accordingly causing the amount of side effects such as temporary psychosis to increase.

Prior to project launch, it was expected that the harm reduction conversations would have to focus a lot on the many possible adulterants that according to official Danish reports\(^{10}\), are found in cocaine. The analyses have however only found one common and problematic adulterant in cocaine – namely phenacetin. Pure cocaine is very soluble in water while phenacetin is only lightly soluble – a message for especially the IV-users has therefore been to notice

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\(^9\) White heroin often has a strong smell of vinegar, but the strength is not necessarily correlated with potency.

\(^{10}\) “Narkotikasituationen i Danmark” and “Narkotika på Gadeplan”
whether their injection liquid is clear or hazy. If the latter is the case, the cocaine is most likely adulterated with phenacetin. Under all circumstances it should raise suspicion and they should be cautious. Not a single user (nor a single personnel) have been aware of the adulterant prior to the project and as it has been found in one out of every six cocaine samples, the knowledge of its presence and its side effects has been one of success stories from the pilot project. The only problematic adulterant mentioned by users was levamisole. This pharmaceutical has previously been featured in the press as it is known to cause agranulocytosis (weakening of the immune system) and retiform purpura (red/purple spots of necrotic skin). To the recreative user this is hardly of any concern but for the daily users there is a real risk that this could cause major health issues with poorly/slowly healing wounds and low resistance to infections. The cocaine users have been informed that low levels of levamisole are possible in cocaine without the FTIR-analyses showing it and they are also informed of the known side effects of the compound.

An interesting aspect of a drug checking service is to let the test results be part of an overall evaluation of users’ health and planning of possible treatments. If this part of the project should have been carried out it would have been necessary to make a detailed plan of important health parameters and the measurements hereof, agreements of reoccurring examinations and drug checks should have been made with a meaningful user group and a permission to do so should be obtained from the National Committee on Health Research Ethics. With the limited time available and the pilot-status of the project, this has unfortunately not been a possibility to accomplish. As mentioned, this is a very interesting aspect and it is therefore suggested that a separate project is established once the drug checking is a routine.

Another obvious question regarding drug checking services are whether they can save lives. It is very important to emphasize that it is not possible to measure such an effect. Not because it is not there but simply because drug checking is anonymous and because a wide range of aspects influence the choices and circumstances of a user’s drug habits. It must however be obvious that if a drug checking service can identify a drug, X, sold as something else, Y, and X has a lower common dosage or a narrower therapeutic index than Y, the service has prevented an overdose with a potential deadly outcome. Another scenario is, if the purity/strength of illegally produced tablets could be determined during a drug check. In this case, the knowledge eg. ecstasy tablet purity could provide an informed basis for the user to decide on and in that way minimize the risk of both mental and physical overdose. These scenarios are however most likely to occur in a nightlife/recreative setting as the number of different drugs here are significantly larger than in the rather conservative drug scenes commonly related to DCRs where cocaine and heroin are the primary drugs.

It is important to emphasize here that not all overdoses are deadly and that even a non-fatal overdose will be an extremely nasty experience for both user, relatives and people witnessing it. Here, even the most basic information about the drug and the even simple harm reduction advice could separate the desired level of intoxication from (fatal) overdose. All-in-all it is important to remember that the primary goal of harm reduction services, such as DCRs and drug checking services, are not only to save lives but also to seek a non-stigmatizing dialogue with drug users based on relevant knowledge. Testing and harm reduction conversations enable the user to make decisions on an informed basis and as such, drug checking services should be categorized as a safety measure with the potential to reduce the number and degree of unwanted drug experiences.
The drug market around SKYEN

Samples and data was collected from May 2017 till February 2018 (10 months). Throughout this period, 306 samples were submitted by 122 different users.

Based on stories from both users and staff there was a clear expectation that especially the cocaine quality would be very low due to everyone cutting something\textsuperscript{12} into the drug to increase profits. One of the most notable results from the project has therefore been that the majority of submitted cocaine samples were of very high purity and seemingly without any diluents/adulterants (see table 2).

\textit{Table 2: The occurrence of diluents and adulterants in 224 cocaine samples.}

<table>
<thead>
<tr>
<th>Diluent/Adulterant</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No additive</td>
<td>173</td>
<td>77</td>
</tr>
<tr>
<td>Phenacetin</td>
<td>39</td>
<td>17</td>
</tr>
<tr>
<td>Sugar</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Creatine</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Fake</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Caffeine</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Levamisole</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Citric Acid</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

As a chunk of high purity cocaine is split into smaller fractions, flakes of a very characteristic glitter are typically formed\textsuperscript{12} (see picture 4). Even though it not a 100% guarantee that adulterants are not present, the glitter is generally a good indicator of high purity. Many of the submitted samples had this characteristic appearance.

An explanation as to why cutting of cocaine is not as common as expected could be that the general supply of cocaine has risen significant over the last few years causing the price to drop. When asked about prices, users tell that if they for instance buy ten grams at a time, the price is typically around 3-500 dkr/gram (40-70 euro). If this is split into smaller fractions, eg. bullets of 250 mg each, the price goes up to 1000-1200 dkr/gram (130-160 euro) and the profit is therefore large enough that cutting is simply not worth the trouble.

As diluted/adulterated drugs are of a more unpredictable character, the high purity is a positive observation, presupposed of course that users dose thereafter. As mentioned previously, this has been a center of attention during the harm reduction conversations with users.

The large number of high purity cocaine samples correlate well with the national trend where the average purity in 2016 was 55% base purity (weight percentage of cocaine chloride 61%). For many years the average has been significantly lower (approximately 20-25% base purity) before going into a rising trend in 2015\textsuperscript{13}.

It is however still surprising that such a large part of the cocaine samples has been without any sign of additives and of seemingly very high purity. It should again be accentuated that the FTIR-system has a high detection limit meaning that a low impurity level (5-10%) is not necessarily identified. Even with this in mind there is no doubt that the average purity has still been significantly higher than expected. The high purity was verified through analyses done at Department of Forensic Medicine in Copenhagen – a sample that consistently

\textsuperscript{12} Street names like “flake” og “fish scale” for high purity cocaine comes from here.

\textsuperscript{13} “Narkotika på Gadeplan 2016”
produced hit qualities between 970 and 990 on the FTIR had a base purity of 85% and did not contain any additives. The weight percentage of cocaine chloride in this sample has therefore been 94-95%! Most project samples without additives produced similar hit qualities.

Interestingly, some users have been very skeptical regarding the project’s high purity estimates of cocaine and this even though it is well-known in the milieu that the general Danish cocaine purity has been on the rise recently. In most cases, it was possible to have a sensible discussion with the doubting users and with the forensic department’s declaration of analysis in hand it was possible to convince most that high purity cocaine is not a rare sight on Vesterbro. At first, the point of the external analyses was to make a quantitative FTIR method (see later) but they have turned out to have a much more important function, as they have added credibility to the drug checking service. Without the users’ trust, the project would die a slow death with no submitted samples.

By far, the most commonly identified adulterant in cocaine samples was phenacetin (see box) with an occurrence of 17%. The levels have varied significantly and every level between traces and pure phenacetin (fake cocaine) was seen. The two samples diluted with creatine were both submitted within the same week and had the same ratio of cocaine to creatine which probably indicates that they both originated from the same trader.

Two cocaine samples were found to contain no psychoactive components – fake samples. One was obviously a poorly crushed paracetamol tablet while the other turned out to be pure phenacetin. While the latter sample was being analyzed, the user unfortunately chose to inject a portion of the drug which resulted in an obvious uneasiness – confusion, shortness of breath and he ended up peeing in his pants. On the basis of his very pale appearance and obvious dizziness the DCR-nurse diagnosed him with very low blood pressure (he did not want to be examined so this was not verified). The user, as many in the milieu, known to have impaired cardiac function and this combined with the negative inotrope effect from phenacetin could have been the cause of this very unpleasant series of side effects.

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**Phenacetin**

The drug is related to paracetamol which is mildly analgetic and fever-reducing. It was removed from both the European and American market in the early 80s, as it was found to be carcinogenic (especially liver and kidneys) and the cause of analgetic nephropathy (harmful to the kidneys) Phenacetin has been known as an adulterant in cocaine for many years but it is not known why this specific compound is used instead of a non-active diluent.

One reason could be that the drug has a known negative inotrope effect – this means that it lowers the maximum capacity of the heart thereby decreasing its work-load. This could cause complications for people with already lowered heart function.

As previously mentioned, a wider array of diluents/adulterants were expected in the cocaine samples and especially the occurrence of levamisole has been significantly lower than that reported in “Narkotika på Gadeplan 2016”. Here, the national occurrence was 53% and the project only identified levamisole in one out of 224 submitted samples. Two things could have caused this – levamisole might not have been a common adulterant of Vesterbro’s cocaine during the project period or the high detection limit of the FTIR-system is the problem. Unfortunately, there are no available statistics of the occurrence of different adulterants/diluents in cocaine seized in Copenhagen and as the newest national figures are from 2016 it makes little sense to compare with these. For instance, the average
purity of cocaine has risen from 39% to 52% and during the same period, the occurrence of levamisole has decreased (on a national level) from 70% to 53%. This underlines the significant changes the cocaine market is undergoing these days. In general, very little information exist on the levels of adulterants found in illegal drugs but in a recent international review, the levamisole content is reported to go as high as 21% (3,3% average) in cocaine from Luxemburg. These figures are from 2011 and are therefore marred with some uncertainty but it is not unlikely that some of the project samples have contained undetected levamisole. A few cocaine samples have also been tested with colorimetric methods but none of these have been positive for levamisole.

Table 3 shows the occurrence of diluents and adulterants found in the 30 white heroin samples that were submitted in the project period. All but one sample were actually yellow heroin but viewed from a chemical perspective it makes no sense to separate white from yellow as they are both water soluble salts of heroin. White heroin is generally accepted as a more purified product than yellow.

<table>
<thead>
<tr>
<th>White Heroin</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No additive</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Caffeine</td>
<td>23</td>
<td>77</td>
</tr>
<tr>
<td>Paracetamol</td>
<td>12</td>
<td>40</td>
</tr>
<tr>
<td>Sugar</td>
<td>7</td>
<td>23</td>
</tr>
<tr>
<td>Dextromethorphan</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Fake</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 3: The occurrence of diluents and adulterants in 30 samples of white heroin

The submitted white heroin samples showed a large variation in both composition and seemingly also in strength. This makes it the riskiest type of drug for the users due to the risk of overdosing caused by potency fluctuations. Visually and texture-wise there has also been a large variety of samples – everything from white powdered samples to yellow-brown crisp chunks going into dark yellow hard-as-stone lumps have been submitted. A common denominator of the samples has been the heavy stench of vinegar.

When the test results are compared with the newest public figures from 2016, the project has identified the same three active adulterants – caffeine, paracetamol and dextromethorphan – and the occurrences are also somewhat similar at 100%, 31% and 8%, respectively. None of these adulterants are the cause of severe side effects such as those of levamisole and phenacetin. Dextromethorphan is a synthetic opioid, but it is only psychoactive and respiratory depressing at very large doses and it does therefore not contribute significantly to the risk profile of heroin.

Two of the white heroin samples were also analyzed at the Department of Forensic Medicine in Copenhagen. One was a typical yellow sample that was found to be 31% pure heroin (weight percent of 34%) adulterated with caffeine. This matched the results estimated from the FTIR-analysis and as it was an approximately average sample of the project period, the average purity of white heroin was based on this sample. The other analyzed sample was the only true white heroin sample from the project period and the only sample where no adulterants or diluents were found. The forensic analysis showed a base purity of 65% (weight percent of 71%) and the lack of adulterants and diluents was confirmed. Considering the lack of additives, it was quite surprising that the purity was not higher, but this is probably

14 “Narkotika på Gadeplan 2015” and “Narkotika på Gadeplan 2016”
15 “The Cutting of Cocaine and Heroin: A critical review”
16 “Narkotika på Gadeplan 2016”
17 https://pro.medicin.dk/Medicin/Praeparater/1034
because illegally produced heroin is comprised of a long row of other active and inactive opioids that make up the remaining percentages.

The median purity of seized Danish white heroin in 2016 was 31% (base purity) which correlates very well with the samples submitted from the project period.

In some countries, especially USA and Canada, the addition of synthetic opioids of the fentanyl-class to heroin is an enormous problem that has cost many lives. In the first half of 2017, 1460 opioid-related deaths were registered in Canada and 74% of these were fentanyl-related. Fentanyl, or any of its analogues, has yet to be found as an adulterant of any Danish drug seized by police but it is not unlikely that it will occur at some point. The FTIR-system at Men’s Home is, due to the high detection limits, not able to detect fentanyl or related compounds in heroin unless the concentration is unusual high. The compounds can however easily and at a low cost be detected by using strip tests dipped into a watery solution of the sample in question. The criticism of these tests is, that not all fentanyl analogues will give a positive indication on them meaning that they could give a false sense of security but still, some detection should be better than no detection at all. A more overall strategy would therefore be to make a massive harm reduction campaign that should also include the hand-out of Naloxone (opioid antidote) to as many known users and their relatives as possible.

Table 4 shows the occurrence of adulterants and diluents in the 34 samples of brown heroin submitted in the project period. Compared with the cocaine and white heroin samples, these samples have been very similar both regarding purities and the cutting agents.

<table>
<thead>
<tr>
<th>Brown Heroin</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No additives</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Caffeine</td>
<td>32</td>
<td>94</td>
</tr>
<tr>
<td>Paracetamol</td>
<td>33</td>
<td>97</td>
</tr>
<tr>
<td>Fake (Dextromethorphan)</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

Almost every single sample contained both caffeine and paracetamol in various levels. Caffeine is added as it makes the drug run more smoothly and thus more times when smoked from aluminum foil. It is not known why paracetamol is added but a simple reason could be that it is easily available and relatively harmless. Sugar is never seen as it would burn/caramelize during the smoking process thereby ruining the drug consumption.

One of the samples had a hit quality very close to that of crushed Panodil (brand of paracetamol tablets) and since no heroin was detected, the sample was deemed a fake. The user also reported a very sparse effect approximating placebo.

Only one of the heroin samples was significantly different as it was found to contain no additives at all and by having a much higher purity than the others. The sample was set up for forensic analysis which showed a heroin content of 39% (base purity). This is a very high purity for brown heroin. The sample was also found to contain dextromethorphan at an unknown level – this was not identified during the FTIR-analysis. Another brown heroin sample, estimated by "National report: Apparent opioid-related deaths in Canada (December 2017)"

19 “Health Canada is advising Canadians of the potential limitations when using test strips to detect fentanyl”
the FTIR-analysis to be a very average sample, was also sent to the forensic lab. According to the analysis, it contained both caffeine and paracetamol, and 20% heroin (base purity) which corresponded very well with the findings of the FTIR.

The median purity of seized brown heroin in Copenhagen in 2016 was 14% (based on four samples) with a range of 8-26%. This corresponds well with the project’s evaluation of the brown heroin market on Vesterbro where the range was 0-39% and an estimated average of 15-20%.

Besides the three primary drug types, cocaine, white and brown heroin, a few other drug types have also been submitted to the project (see table 5).

Table 5: Summary of other submitted drug types

<table>
<thead>
<tr>
<th>Drug</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amphetamine</td>
<td>6</td>
</tr>
<tr>
<td>Methamphetamine</td>
<td>2</td>
</tr>
<tr>
<td>MDMA</td>
<td>2</td>
</tr>
<tr>
<td>Ecstasy tablet</td>
<td>2</td>
</tr>
<tr>
<td>Crack</td>
<td>2</td>
</tr>
<tr>
<td>Others</td>
<td>4</td>
</tr>
</tbody>
</table>

Of the six amphetamine samples, two were without any additives, two very adulterated with approximately 30% caffeine, one was diluted with an estimated 60% potato starch and the last was 30% creatine and 20% sugar. All these samples were significantly more potent compared with the 11% (base purity) median of seized Danish amphetamine in 2016. Both submitted methamphetamine samples were clear as glass-crystals of very high purity and no additives.

Of the two submitted MDMA samples, one was high purity MDMA and the other high purity cocaine – neither contained any additives. In both submitted ecstasy tablets, MDMA was found but it was not possible to evaluate the strength hereof. This would require a different analytical setup or a purification protocol which is out of the scope of this project.

Crack is cocaine free-base – ie. cocaine chloride (regular cocaine) that has been boiled with a base. The boiling process is actually also a simple purification as most adulterants and diluents do not have the same chemical properties as cocaine (levamisole being the exception). A crack-related question from both users and staff has been whether there are leftovers of ammonium hydroxide (the strong base traditionally being used to boil cocaine in Denmark) in the crack after the boiling process and if so, whether the levels are high enough to be a health concern. The two submitted crack samples were freshly prepared and had both been washed with water. Due to the high detection limit of FTIR it was not expected to find any level of ammonia in the samples which was also not the case. As the human nose is extremely sensitive to the smell of ammonia and the samples had no smell hereof, it was concluded that any remaining trace-level ammonia was insignificant and of no concern compared to the harm caused by sitting in a room full of ammonia vapors from the boiling process.

The last four samples were all tablets of different origins and here, the FTIR system has met another challenge regarding the detection limits. Many tablets contain large amount of fillers relative to the active compound causing the signal of the latter to be dominated by that of

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20 “Narkotika på Gadeplan 2016”

21 “Narkotika på Gadeplan 2016”
the fillers. It would be interesting and relevant for DCRs to be able to identify especially benzodiazepins and other potent pharmaceuticals as there is a big market for these. Due to the high potency and sheer amount of different but very chemically similar benzodiazepins the analysis hereof would require a more extensive and sophisticated analytical setup than that of this pilot project.

High on both users’ and the staff’s wish list was the possibility to obtain an exact percentage of active compound in the submitted samples – i.e. a quantitative analysis. As previously mentioned, this was unfortunately not possible to do, not because of the equipment but because that would require a large training set with samples of known composition and purity which the project did not have access to. Through the good collaboration with the Copenhagen Police there was however given permission to collect a series of larger samples (approx. 100 mg/0,1 gram) that were sent to qualitative (identification of components) and quantitative analysis (purity of illegal components) at the Department of Forensic Medicine in Copenhagen. Comparing the results of the forensic analysis with those of the FTIR, it was possible to make a simple quantitative method for cocaine while it was not possible to obtain good linearity for heroin. This was probably due to heroin being a more complex mixture of alkaloids in relevant levels than cocaine. FTIR-analysis is only based on detection and does not involve a separation step, making IR-spectra of molecules with similar functionalities overlap causing significant uncertainties.

The quantitative method for cocaine still has a weakness as it was not possible to verify its accuracy over time. This would require a control sample, i.e. a sample of known composition and purity, that could be analyzed in regular intervals to ensure the method’s stability. As the project does not have permission nor interest in storing larger quantities of illegal drugs over an extended period of time, it is not possible to know how much the accuracy of the quantitative method varies over time. Purities measurements of cocaine are therefore marred with some uncertainty and with the current setup it should be considered to use a graduation of purities instead. This could be done by using a five-step scale of very high/high/medium/low/very low purity, but this would require a larger degree of subjective evaluation which is currently an undesirable approach.

10. Future perspectives
During the project, experiences have been made, thoughts have been thought and ideas have arisen as to how a version 2 of a DCR drug checking project could be designed – what could be done differently and better, and how could the concept develop over time.

An obvious scenario is, that Men’s Home contribute to the start-up and development of new drug checking projects in relation to other DCRs – starting in Denmark and then moving on to Europe. Several DCRs, both nationally and abroad, have already shown interest in the project and it would therefore be obvious to offer drug checking oriented training program at Men’s Home to share experiences. An interesting way to do this could also be to fundraiser money for another FTIR-setup and send it along with personnel from Men’s Home to visit other DCRs. This way, Men’s Home could boost the professionalism of working at a DCR and it would change the scenario from knowledge sharing to knowledge exchange, making it a growth opportunity for both parts.

As mentioned in the discussion, part of the initial plan was to evaluate whether drug checking could be included in an overall evaluation of users’ health as a way to better understand and treat the often complex health conditions arising when people live such stressful, risky and vulnerable lives as they do in the milieu around Men’s Home and SKYEN. This was, as mentioned, too ambitious and comprehensive for a project that was even guaranteed to succeed on the primary goal, namely the drug checking. As the framework is in place and the staff is
becoming more and more confident with the drug checking procedure it would, with the right partners, be possible to define a separate project to dive into the health perspectives of drug checking.

The acknowledgement that drug checking is an actual harm reduction initiative and does not increase the users’ risk, is slowly gaining momentum in Danish drug policy. In March 2018, the city council of Copenhagen enacted with a large and broad majority, that anonymous drug checking should be part of the 2019 budget. Men’s Home has not been part of this process and the target audiences are also in quite different, but hopefully the experiences from this pilot project can still add to the planning and shaping of the upcoming public drug checking service of Copenhagen.

Hopefully the whole idea of drug checking will normalize to such a degree that it is possible to make an alliance with one of the three Danish forensic departments, thereby allowing a qualification and significant improvement of the harm reduction effort in Denmark. Such a collaboration would for instance make it possible to develop and determine the accuracy of quantitative FTIR-methods, identify the detection limits of different drugs very importantly, it would be possible to have selected/difficult samples sent in for high-end analysis. This would be relevant in cases where the FTIR-system can detect but not properly identify a component or just as a routine to verify the test results.

Based on the pilot projects very limited extent, it was not prioritized to do a structured data collection to evaluate the effect of drug checking on users’ drug habits. Such a study, qualitative or quantitative, would be rather time-consuming and thereby also very costly, and to avoid mistakes it would also have to be done by experts. It would therefore make sense to collaborate with Centre for Alcohol and Drug Research at Aarhus University to make an extended evaluation of the drug checking service at Men’s Home.

11. Conclusion

The goal of the pilot project has been to gather know-how from an anonymous drug checking service in the milieu connected to a DCR and hereby gather, use and spread knowledge about the local drug market in a harm reduction perspective.

Overall, the project has been a success. The interest and willingness of users to submit non-refundable samples has been paramount for this success. 122 users submitted 306 samples over a period of ten months. The analytical results have been a good point of reference for a constructive dialogue with the users about drug habits, dosage, etc. The conversations with users have also been used to inform them about known and found adulterants with serious side effects. The project has not included a study of the habit/pattern-changing effect of drug checking. Such an evaluation was deemed too extensive in lieu of the limited time and resources available. Furthermore, such a study should be performed by specialist to ensure a sufficiently high data quality.

A very important result is, that there have been no problems with neither dissatisfied users, traders nor from higher levels of the supply chain and it has therefore been safe and sound to run a drug checking service through-out the project period.

As expected, it took some time to find the right form of the practical aspects of drug checking. During the last months of the project, the service was directly associated with the DCR and the opening hours were thereby expanded from 15 hours per week to almost 15 hours daily. This brought the staff closer to the project and made it possible to use their good relations with the users – a crucial step in the process of implementing the drug checking service at the DCR.

An interesting experience from the project has been that it was possible to start a constructive dialogue with a drug trader who was
known in the milieu for selling cocaine adulterated with phenacetin. The trader did not know the adulterant beforehand nor its side effects and was subsequently willing to ask his supply chain to find a better and less harmful cutting agent.

Part of the project’s goal has been to give staff and users a relevant insight into the local drug market around the DCR SKYEN on Vesterbro, Copenhagen. The project has seen a majority of cocaine samples submitted to the drug checking service and these contained way fewer adulterants and diluents than expected. As a consequence, the purity has also been significantly higher – no one expected that it was possible to find 95% pure cocaine on Istedgade. 77% of the 224 submitted cocaine samples did not contain any adulterants or diluents meaning that they were very high purity – this has been an astounding find, to say the least. The only commonly occurring adulterant found in cocaine was phenacetin. Not a single personnel nor user knew the compound before the project started and the harm reduction conversations have therefore focused on spreading the word on the compound and its harmful side effects. Both the submitted white and brown heroin samples have in content and purity been comparable to samples from police seizures analyzed at the forensic departments. Besides cocaine and heroin, the project has also analyzed a few other drug types and a common denominator of these has been few to no additives and generally a (very) high purity.

The FTIR-results have for the most cases been sufficient for the staff to comment on the samples’ compositions. There is however room for improvement, as it for instance was not possible to make a robust quantitative method with the available material. The low sensitivity (high detection limits) of the FTIR combined with the lack of a separation step in the analysis could also be problematic in cases where small amounts of very potent drugs are present. In case of a future project with a larger budget, the possibility to gain access to more advanced analytical equipment, such as GC/LC-MS, should be examined – this could be through an external analytical partner.

The pilot project has brought new questions, issues and ideas to the surface and has thus paved the road for further development of the drug checking concept, both at Men’s Home, nationally and abroad.

Hopefully, the project can affect the public debate which is often based on the misunderstood moral and/or political viewpoint that the prohibition of certain drugs is a benefit for both society and the individual. Knowledge, support and accept that some people, for whatever reason, chose to use drugs is a viable path even though it could seem controversial and provoking. Not many years ago, the thought of publicly financed drug consumption rooms and free heroin was far into the future and even though we cannot see a clear positive effect of these initiatives in the drug related death statistics, there is no doubt that these services are fully legitimate health/dignity/safety measures for drug users. Anonymous drug checking services and honest harm reduction advice belong in the same category and if we in Denmark intend to follow the general trend in Europe, the future will bring more drug checking projects and in time, a normalization of the concept throughout society. Just the fact, that it has been possible to launch, complete and gather experiences from a Danish drug checking project has been a milestone on the road to a more safe and dignified life for the people that, for whatever reason, chose to use drugs.
12. Financing
Salary expenses have been financed by a grant from Helsefonden.

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A giant thank you to these foundations for being progressive enough to finance a controversial yet innovative harm reduction initiative in favor of one of the most vulnerable groups of citizens in Denmark.

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WeAreTheLoop.org
14. Appendix A: IR spectrum of high purity cocaine

Picture 5: An example of a cocaine sample with high hit quality (973) and thereby also high purity. Visually there is also a good correlation between the recorded spectrum (red) and the database spectrum of cocaine (blue). See appendix A for larger version.
15. Appendix B: IR spectrum of cocaine with phenacetin

Picture 6: An example of a cocaine sample with a hit quality of 753, indicating two or more components. This can visually be confirmed as the recorded spectrum (red) and the database spectrum of cocaine (blue) does not match. The search algorithm Mixture Analysis can be used to identify the remaining components. See appendix B for larger version.
16. Appendix C: Protocol

Drug checking is voluntary and anonymous and is only a service for users covered by the partnership agreement between Copenhagen Police and the Municipality of Copenhagen regarding drug consumption rooms. This implies that the target group is “heavily dependent drug users with a longer lasting and sustained abuse of drugs”. This means that eg. weekend/recreactive users and minors (below 18 years) are not encompassed by the service and should be rejected.

Users are registered by nickname (if known in SKYEN the nickname from here is preferred), year of birth, home municipality and gender. The first time a user wishes to use the service, a user agreement similar to the one from SKYEN, is signed (See appendix D).

The sample is registered in a spreadsheet with nickname, date, sample type (cocaine/heroin/etc), expected purity, form (before/after consumption), appearance (color, powder, chunks, etc.) and file name of IR-spectrum.

Drug checking can only be done by trained personnel (see spreadsheet with list hereof). This list should always be kept ajar and by changes/additions, the edited list should be sent to the local police before new personnel performs a test.

Prior to analysis, a background analysis is done to zero the FTIR. 3-5 mg (0.003-0.005 gram) of the sample is measured by eye (enough to cover the area of measurement). The sample is handled with a spatula and placed on the area of measurement prior to analysis. The spatula is wiped with isopropyl alcohol. After the analysis, the sample is destroyed by wiping the it FTIR with an isopropyl alcohol napkin that is subsequently disposed of.

The analysis takes 30-60 seconds whereafter the search for components using the selected search libraries can begin. Depending on the complexity of the sample, this could take a few minutes. The more components the longer time.

When the evaluation is done, the results are communicated orally to the user. An example could be “The sample contains 20-30% cocaine, it is adulterated with approximately 30% phenacetin and diluted with approximately 20% creatine – it was not possible to declare the remaining percentages”. If problematic adulterants are found (eg. levamisole, phenacetin, griseofulvin, other psychoactive compounds, etc.) or an unusual purity (high/low), extra attention is brought hereto. Known side effects of active adulterants (pharmaceuticals) are also communicated.

When communicating the results, it is very important that consumption of drugs must not be encouraged, and no drug must be labeled as safe to consume.

The raw spectrum is saved using the following nomenclature: YYMMDD_DRUGTYPE_INITALS_# (eg. 170418_cocaine_KBG_4) and the communicated results are saved in the spreadsheet.
17. Appendix D: User Agreement

Agreement on the use of the drug testing service

Before I use the offer of drug testing I am informed that:

- You must hand over a small sample of the drug for testing and the sample will not be returned after the analysis.

- The drug test is only indicative and does not necessarily identify every drug/cutting agent in the sample.

- I am responsible for complications caused by the intake of drugs, even though they have been tested.

- The staff will save the results in anonymized form to get a better insight into the composition of drugs. Data can be used for publications, presentations and the like.

- The staff is not responsible for lost possessions during drug testing.

- I am willing to follow The Mens Home house rules and appeals from the staff.

Signature and date: ________________________________