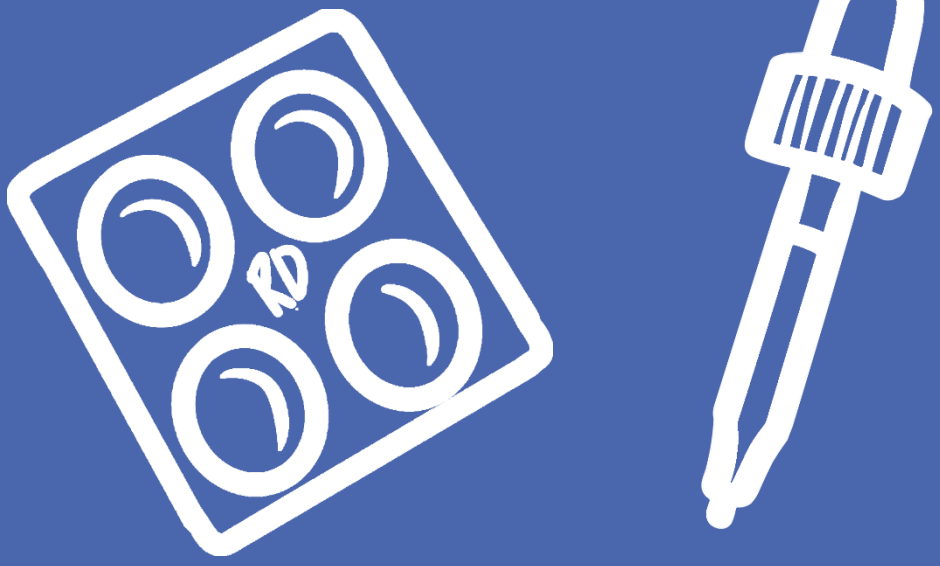


PARTY DRUG CHECKING PROGRAM: 2023 REPORT

Reduciendo Daño Foundation

Chile

Table of contents

Message from the team

The "Reduciendo Daño Foundation" (RD in Spanish) team has prepared this document to compile part of the work done by our group in 2023. We thank the reader for their interest in our work and its results.

RD is a project that arose from the need to minimize the harm caused by drug use, a practice that is becoming increasingly common. While the best way to avoid harm is not to use drugs, those who have already chosen to do so should not be left behind.

Over the years, we have observed how crucial information is in this context, as a well-informed person can make better decisions regarding drug use. For this reason, we have taken on the responsibility of informing people about drugs and their effects—not from a punitive perspective, but rather from a comprehensive viewpoint that considers various aspects, with empathy and without judgment toward those who choose to consume.

The field work at RD is particularly important in fulfilling this role. Providing drug related information and providing drug checking services to those attending events with a high incidence of drug use is a task that can, on many occasions, be lifesaving. Therefore, we are committed to making this work an essential part of our ongoing efforts.

The party drug checking program began in 2019; however, it has experienced exponential growth in the last two years, thanks to the support of our followers, those who purchase reagents, and those who make donations to our organization. We also extend our thanks to the event producers who choose to involve us and, above all, to the individuals who dedicate their time and become part of our volunteer team.

We will continue to work to improve our services, expand our presence to more regions of our country, collaborate with organizations in other countries, and develop better methodologies for party drug testing.

Camilo Obregón Fernández (Chemical analysis area director)

Isidora Vidal Ávila (Party drug checking program director)

The Reduciendo Daño Foundation Board

Introduction

Recreational drug use is an issue of global concern due to its potential health risks and associated social impacts. The lack of accurate information on the composition of the substances consumed further increases the dangers associated with drug use, as individuals may be exposed to unknown adulterants or dangerous combinations [1]. In this context, harm reduction has emerged as a key approach to address problems related to drug use.

Rather than adopting a punitive approach, harm reduction focuses on minimizing the risks and negative impacts associated with the use of psychoactive substances. One of the effective strategies in this regard is the implementation of drug checking services, which seek to provide users with accurate and timely information on the composition of the substances they plan to ingest. **The implementation of drug checking services around the world has been shown to decrease the harms associated with drug use [2], saving lives from possible overdoses [3, 4] and potentially decreasing drug use [5]**.

Drug checking has become increasingly important in several countries that recognize the need to address substance use from a more informed, public health-oriented perspective. Among the countries that have actively embraced drug testing as a key harm reduction strategy are the United States [3][4], Canada [6], Australia [7] and several European countries [5, 8]. In South America, Colombia stands out as a pioneer in the implementation of analysis services in mass events [9]. However, in countries such as Brazil, Argentina [8] Peru [10], Chile [11] analysis services are being implemented, with origins in non-governmental civil organizations, showing a significant growth of this practice in the region. [8].

Music events (parties, festivals, among others) are instances where there is usually a high rate of drug use [12, 13], or even the consumption of substitute drugs with a high risk to the health of the consumer [14]. For this reason, the implementation of harm reduction and drug checking services at this type of events constitutes a service to the community whose purpose is to **prevent accidents, save lives and educate the population about drug use [15, 16].** Contrary to what one might believe, the implementation of these services **does not increase drug consumption [17]** and **may even reduce it [5, 15, 18].**

Since 2019, RD has carried out interventions at parties. These consist of setting up a care post and performing colorimetric drug checking on those who attend and wish to use the service, always free of charge. In addition, the people who use the service are educated about the drugs they intend to use. Illustration 3 is an example of a party stand.

The impact of RD's work in Chilean society can be seen in the increase in the number of people who decide to use the services it provides. As can be seen in Figure 1, the number of interventions carried out by the foundation has been growing over time (except for the COVID pandemic years).

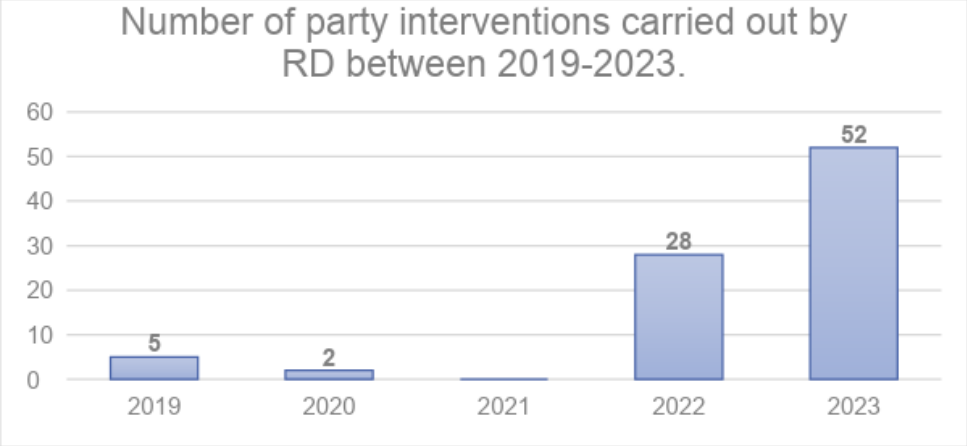


Illustration 1. Annual interventions carried out by RD between 2019-2023

Another reflection of the work being done is the number of people who can access the use of colorimetric reagents outside of an intervention, for this, RD has done the work of distributing reagents and especially giving them away in single-use formats, which can be used in an expeditious and personal way. **It is estimated that in 2023, approximately 8,000 tests were given away at events alone**, which translates into a large population of people who use drugs gaining access to colorimetric analysis of substances, **allowing them to minimize the damage of their consumption and possibly avoid the consumption of substances that could have caused harmful effects on their health.**

The following document is a report on the results obtained in the field by the Reduciendo Daño Foundation in the year 2023, in which more events were attended than in any other year in its history, covering 6 regions of the country on different occasions.

Methods used for analysis

Colorimetric drug analysis

Colorimetric analysis is the study of color changes caused by chemical reactions that modify compounds, resulting in an observable change in the color of a liquid or solid.

In the field of drug analysis, colorimetric analysis is a basic tool that allows rapid qualitative information to be obtained on the presence of certain drugs in a sample. Its great advantage lies in its low cost, time of the result and portability of the instrumentation, which makes it easy to take the analysis anywhere. **The results obtained by this analysis only provide information about the drugs that might be present, and not about their "quality" or purity.**

RD is dedicated to the elaboration and distribution of colorimetric reagents, also known as "tests". This is carried out in laboratories that allow the preparation of reagents with quality and safety standards, by a chemical team trained for this purpose, using as a reference the protocols established by international organizations. [19].

The range of reagents produced by RD includes 12 different tests, which can detect most of the psychoactive substances currently consumed.

Intervention procedure

The party drug checking program begins when the RD team asks the user about the substance they wish to test for, primarily to obtain information about what they think they will consume. **For legal reasons, these samples are not stored or handled by the team.**

Once a small amount of the sample to be analyzed is placed on the testing surface by the user, the trained RD team proceeds to add, as appropriate, the colorimetric reagents established by the testing protocol for each substance.

Due to the inability to detect mixtures, only "negative" or "positive" results are recorded for the substance sought. These results are obtained by comparing the colors seen by the reaction between the reagent and the substance, with those recorded and supported by different studies and organizations.

When a substance does not react as expected, it is marked as "negative". If a substance is recorded as "positive", it means that it reacted as expected, **although this does not guarantee that the substance is free of adulterants or that it is safe for**

human consumption. This last aspect stands out due to the inability of the reagents to detect mixtures of substances, unreacted substances or other chemical compounds that could be harmful to health (drugs, heavy metals, toxins, among others).

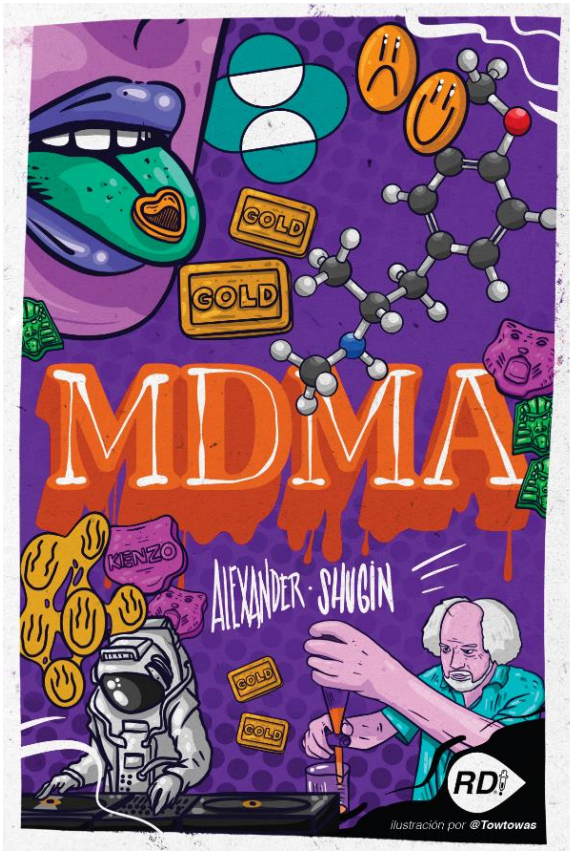
The result obtained by colorimetric analysis is delivered at the same time to the person using the service, who has usually observed with his own eyes how his sample reacts.

When the result is negative, we inform the person that the substance is not the one expected and we make an advice about the high danger of its consumption. In many cases, these people choose to discard the substance, as they do not wish to expose themselves to risks. However, in other cases, the person decides to consume it anyway, but does so with extreme caution thanks to the recommendations provided by the RD team.

When the result is positive, the person is informed that the substance they believe is present in the sample. However, the RD team communicates this result with the caveat that a positive result entails only the presence of a substance, **and that under no circumstances would this substance be free of adulterants or safe for consumption**.

When a sample reacts negatively, it is impossible to know precisely what it is adulterated with. However, based on the color seen, it is possible to distinguish certain common "families" of substances present or well-known adulterants, such as levamisole in cocaine or amphetamines in ecstasy, among others. The results are recorded individually and then tabulated.

Our approach includes the provision of resources and guidance so that they can take concrete and effective measures to reduce the risks associated with substance use. See Illustration 2 for an example of graphic resources that are given in the stand.



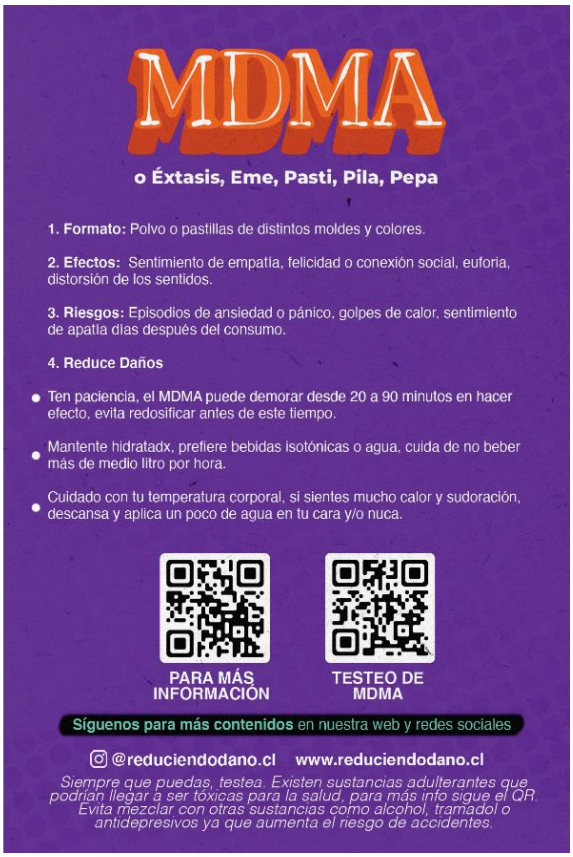


Illustration 2. MDMA information poster handed out at events

Illustration 3. Photograph of a party analysis intervention (Santiago, 2023).

Analysis protocols by substance

In general, the drugs analyzed at the parties attended tend to be always the same, being mostly Ecstasy, Tusi, Cocaine, Ketamine and LSD. Therefore, each of these substances has a specific protocol that considers the reagents to be used in their analysis.

The number of reagents used for each drug varies depending on the intervention, but a minimum of two is always preferred to ensure accuracy, with three or more being ideal. If any reagent produces an unexpected reaction, it immediately signals that the substance may not be as anticipated.

Ecstasy/MDMA

When the drug tested consists of an ecstasy tablet, the component being sought is MDMA. Although it is often assumed that the two are the same, it is important to note that MDMA is the name of a chemical compound, while ecstasy (also known as stacks, pastis, among other names) is a popular term for tablets containing this substance. However, in this format, MDMA is many times found in combination with other drugs, or in some cases, it may not be present at all [20].

MDMA has the distinct characteristic of reacting with most available reagents. However, in many cases, it reacts in a very opaque manner (purple or black), making it difficult to detect other substances that might be present in the tablet.

The reagents used in interventions to detect the presence of MDMA and their respective reactions are:

Table 1. Colorimetric reactions of ecstasy. References: [21-28]

Reagent	**Color**
Marquis	Purple-black
Mecke	Green-black
Froehde	Yellow-blue-black
Simon's	Blue

Tusi

The case of Tusi is unique, as it is not a single drug but a mixture of various substances, with its main components typically being ketamine, usually accompanied by MDMA, caffeine, cathinones, among others [29, 30, 31].

Due to this complexity, testing Tusi doesn't yield a simple positive or negative result. Instead, the test provides as much information as possible about the substances present in the mix.

Typically, tests are conducted to detect ketamine and MDMA, but other substances like amphetamines, opioids, cathinones, and LSD are also screened using a variety of reagents. This "screening" process aims to reveal the presence of multiple substances in the mixture.
Reagents used for checking Tusi are the ones used for each substance screened, mostly this consists of every possible reagent available.

Cocaine

When cocaine is analyzed, the objective is not only to detect the presence of this substance, but also to detect the presence of its most common adulterant: levamisole. [32]. This is achieved by using a combination of two reagents (Marquis-Liebermann) that allows distinguishing between the presence of amphetamines and levamisole. Morris reagent is then used to confirm the presence of cocaine or its analogues.

Table 2: Colorimetric reactions of cocaine. References: [3-9]

Reagent	**Color**
Liebermann	Yellow
Marquis	No reaction
Morris	Blue

Ketamine

To prove the presence of ketamine, either in Tusi or on its own, we use the same reagents as are used for cocaine, where they react in the same way. Only the use of the Morris reagent makes it possible to distinguish between the two [33].

Table 3: Colorimetric reactions of ketamine. References: [21-27]

Reagent	**Color**
Liebermann	Yellow
Marquis	No reaction
Morris	Purple

Other

Other substances analyzed have their own protocols, however, they correspond to a small amount of the total amount of drugs analyzed, so they are not included in this document. The most common of this list is LSD, which is analyzed with the Ehrlich, Hofmann and Marquis test. [27].

Results

Interventions performed

In 2023, more than 50 events were attended throughout Chile, mostly electronic parties. An internal estimate of the team in charge is that around 1200 analyses were performed throughout the year; however, data from only 14 events were recorded, with a total of 597 analyses recorded. This is because in some events it is not possible to perform colorimetric analyses. In these cases, it is decided to use mechanisms such as rapid or single-use tests, which are provided free of charge so that people can use them privately and at their disposal; however, no recordable results are obtained in these cases. There is also the case of events where analysis is performed, but it is not possible to keep a record of these for different factors.

The number of total analyses recorded in 2023 is **597**, which were analyzed in 14 different events, with an average of 43 analyses per event.

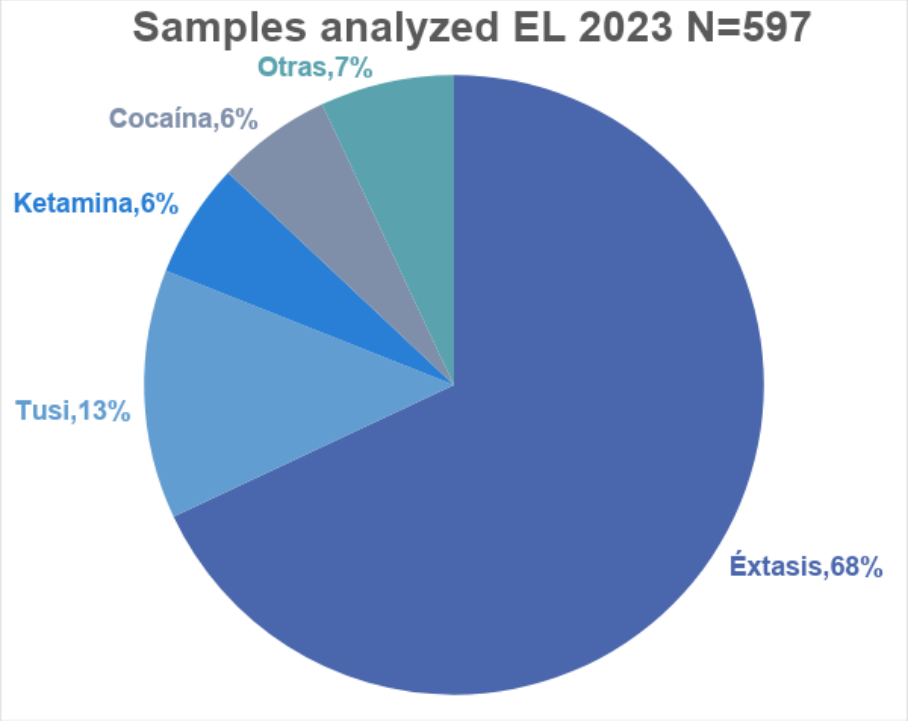


Illustration 4. Percentage of analyzed samples corresponding to a particular drug.

Ecstasy/MDMA

Of the total number of samples analyzed, 68% corresponded to ecstasy tablets or MDMA in crystal form. For this substance, it was observed that 75% of the analyses reacted positively to the presence of MDMA.

When the result is negative, the most common family of adulterants is the amphetamines (amphetamine, methamphetamine).

It is not possible to detect mixtures of different drugs together with MDMA, so it is impossible to determine whether positive samples also contain other drugs.

Ketamine

Ketamine accounted for 6% of the total number of samples analyzed. For this substance, 76% of the analyses reacted positively to the presence of this substance.

When the result is negative, a common adulterant cannot be identified, so the substances that might be present are unknown. By reacting clearly (yellow or no reaction), when a positive reaction is present, it is also possible to know that there is no presence of substances whose reaction is obscure (MDMA, amphetamines, "classic" opioids).

Cocaine

Cocaine accounted for 6% of the total number of samples analyzed. For this substance, 59% of the analyses reacted positively to the presence of this substance.

The most common adulterant found is Levamisole. By reacting clearly (yellow or no reaction), when there is a positive reaction, it is also possible to know that there is no presence of substances whose reaction is dark (amphetamine, methamphetamine).

Tusi

13% of the total number of samples analyzed corresponded to Tusi. The results obtained were recorded according to the compounds that could be identified in the sample:

- Only ketamine detected: 40%.
- Ketamine and MDMA detected: 21%.
- Ketamine and cathinones detected: 3%.
- Substances that may be present are unknown: 36%

Comments on the results

On average, the overall positivity of the tests is 74%, meaning that **a quarter of the drugs tested did not correspond to what was expected**. This number represents a concern from a public health perspective, as a high number of people could be consuming unknown substances and/or substances with a high potential to cause harm, believing that they are consuming something else. This also represents a problem for healthcare centers that receive synthetic drug intoxications, since the person may not know the composition of what the patient has ingested, making correct treatment difficult.

Compared to similar drug testing services in other countries, **drugs in Chile appear to be supplanted more frequently**: in Australia reports have indicated an overall positivity of 88% [16], while in Colombia, the positivity rate is around 84% [9] **both figures being over 10% higher than those observed in Chile**.

Ecstasy/MDMA: The high frequency of ecstasy analysis in the events highlights the importance of addressing this drug, which is the most consumed in these events. Its positivity in Chile seems to be lower than that reported in other countries, which poses the challenge of analyzing in depth the composition of this substance in the country.

Tusi: Uncertainty in the composition of Tusi represents a significant risk to people who consume it, this is reflected in the high percentage of samples where it is unknown what substances might be present. This situation underlines the need to address the complexity of the mixtures and their potential impact on health.

Cocaine: The presence of levamisole in cocaine samples is of concern due to the potential long-term consequences of its use. This adulterant is commonly detected along with the presence of cocaine, this is not unique to the country [34]. The results observed highlight the importance of educating about the risks associated with cocaine.

Ketamine: The need for more advanced tools to identify adulterants in ketamine is highlighted as an area for improvement. In addition, the suggestion to search for opioids such as fentanyl using antibody tests highlights the importance of adapting testing techniques to the evolving recreational drug landscape.

Future projections

The growing complexity of synthetic drugs poses challenges for their analysis, for which it is necessary to adapt to the observed reality and develop methodologies capable of addressing the new problems that arise in this regard:

The possible presence of substances such as **fentanyl**, the consumption of which carries significant risks and has been identified as one of the main causes of overdoses in North America. [3], represents a major challenge due to the low concentrations in which it is usually found. Timely identification of fentanyl adulterated substances requires methodologies that are more costly and difficult to apply than colorimetric analysis. An alternative for rapid analysis of fentanyl are antibody strips, capable of detecting this drug in reduced concentrations [6].

Starting in 2024, our service will be enriched with the ability to perform fentanyl analysis using antibody strips, seeking to detect this substance before someone consumes it and experiences its dangerous consequences.

Another substance on the rise in Chile is **Tusi**, which presents its own challenge due to its composition as a mixture of various drugs. For this reason, new colorimetric reagents will be implemented for the purpose of identifying benzodiazepines.

Given the growth of drugs presented as mixtures of different substances, it is imperative to adapt our methodologies to separate and identify the components in these samples. Thin plate chromatography (TLC) is presented as a viable option; therefore, RD is studying its implementation as an analytical service.

As drug checking programs expand and gain more attention, it becomes evident that the available analytical techniques are not always optimal. Addressing this issue requires not only the implementation of better equipment and techniques to enhance analysis but also a focus on legal aspects to ensure safe operation.

To continue the RD mission of bringing harm reduction to people, it is crucial to have the financial resources to support the costs of this vital work. To date, we have funded these operations through the sale of reagents and donations. However, to expand the Foundation's influence and reach even more people, more resources and equipment are needed to facilitate on-site testing. In this regard, we call on those who share our motivation for the welfare of society to support our work: whether by sharing our work, making donations or encouraging the purchase of testing reagents.

Acknowledgments and contact

This report has been prepared by the Reduciendo Daño Foundation, particularly by the chemical analysis area, the party drug checking program, and the academic project, which is able to function only thanks to its team of volunteers.

In this same way, the foundation's board of directors has made possible the management and continued operation of this and other projects, for which special thanks are extended to the people involved:

- Volunteering in the chemical analysis area
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  - Rodrigo Siciliano
  - Carlos Esparza
- Design of graphics used in interventions
  - Tomás Arrey
- Reduciendo Daño Foundation Board of Directors
  - Camilo Obregón
  - Ivan Perez
  - Isidora Vidal

We are especially grateful to the event producers who have trusted in our work, and who, despite the stigmas and difficulties, have allowed us to bring our work to their events, also allowing the attendees to have free access to the drug testing service and the various harm reduction tools that our organization provides.

We thank everyone who has purchased reagents, donated, shared our publications and supported our work.

To learn more about the foundation, visit: **www.reduciendodano.cl**

If you wish to contact the foundation for interventions or other purposes, please send an email to **contacto@reduciendodano.cl.**

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