



LEADER

Looking at Economic Analyses of Drugs and Economic Recession

Lisbon Addictions Conference

Lisbon, September 23, 2015



**Symposium session B:
Costs and crises: the LEADER project — examining
the avoidable burden of drug use in the current
economic climate**

Chair: Toni Gual, Spain





Index

- Introduction to the LEADER Project
- Systematic Review on Social Costs: Illegal Drugs, Alcohol, Tobacco
- Methodologies for calculating illegal drug social costs: a systematic review of guidance documents
- Guidance document on the methods for estimating the social costs due to drug use
- How economic crises affect use of illegal drugs, tobacco, and alcohol: a realist literature review
- Take home messages





Introduction to the LEADER project

Toni Gual





What is LEADER about?

Looking at
Economic
Analyses of
Drugs and
Economic
Recession

LEADER
Looking at Economic Analysis of Drugs and
Economic Recession

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ALICE RAP | **LEADER - Home** | LEADER - Partners | Social costs of addiction | Impact of economic crises | References repository | Contact

You are here: [Home](#) » LEADER - Home

Welcome to LEADER

LEADER is a European research project, co-financed by the European Commission since January 2015, which aims to enhance the economic analyses of illicit drugs through 2 core objectives:

- the development of methodologies and guidance for estimating the comprehensive social costs of illicit drug use
- reviewing the impact of economic crises on drug use and implications for drug policies and preventive practice

[Download the project summary](#)

Research Questions

[Estimating social costs](#) | [Recession](#) | [Client reality](#)

<http://www.alicerap.eu/home-leader.html>

JUST / 2013 / ACTION GRANTS





What is LEADER about?

The goal of LEADER is to enhance the economic analyses of illicit drugs through two core objectives:

- the development of methodologies to estimate the social costs of illicit drug use**
- to review the impact of economic crises on drug use and drug policies**

Building on the experience of estimating the social costs of illicit drug use in three jurisdictions within the ALICE RAP project





Aims of this Symposium

- To share initial results of the LEADER project
 - Systematic Review of Social Costs of Illegal Drugs, Alcohol & Tobacco (Pablo Barrio)
 - Systematic review of methodologies for calculating social costs of illegal drugs (Vincenzo Vella)
 - Guidance document on the methods for estimating the social costs due to drug use (Zofia Mielecka-Kubien)
 - How economic crises affect use of illegal drugs, tobacco, and alcohol: a realist literature review (Gera Nagelhout)
- To discuss the results presented (please, ask questions)







Systematic Review Social Costs Illegal Drugs, Alcohol, Tobacco

Pablo Barrio





Social costs

$$\begin{aligned} &\text{Social costs} \\ &= \\ &\text{private costs} \\ &+ \\ &\text{external costs} \end{aligned}$$



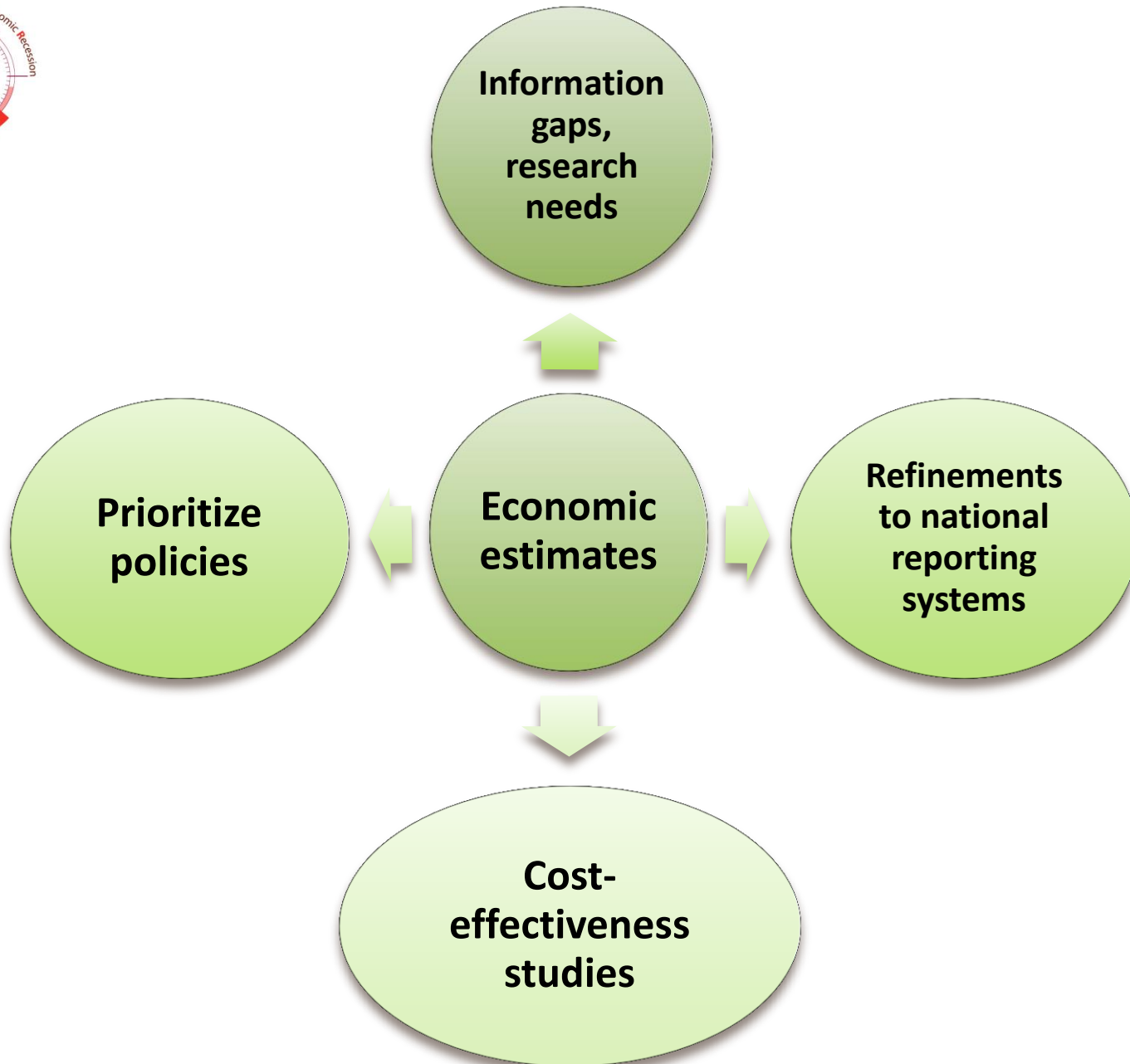


Is it necessary?

Psychoactive substances

- Large consequences







Methodology

Systematic Review

- PubMed
- Scopus
- Grey Literature
- Previous Systematic Reviews





Exclusion Criteria

- Studies conducted before 1990
- Studies outside the European Economic Area
- No English summary available
- No costs quoted
- Not an original research article
- Specific populations or subgroups (e.g., pregnant women, underage people)





Data extraction

Methodological characteristics

Cost components included and its **magnitude**

Total estimated cost of illegal drugs, alcohol and tobacco





Data extraction

Methodological characteristics

- cost estimates

 - (prevalence vs. incidence estimates)

- premature death estimates

 - (human capital vs. willingness to pay)

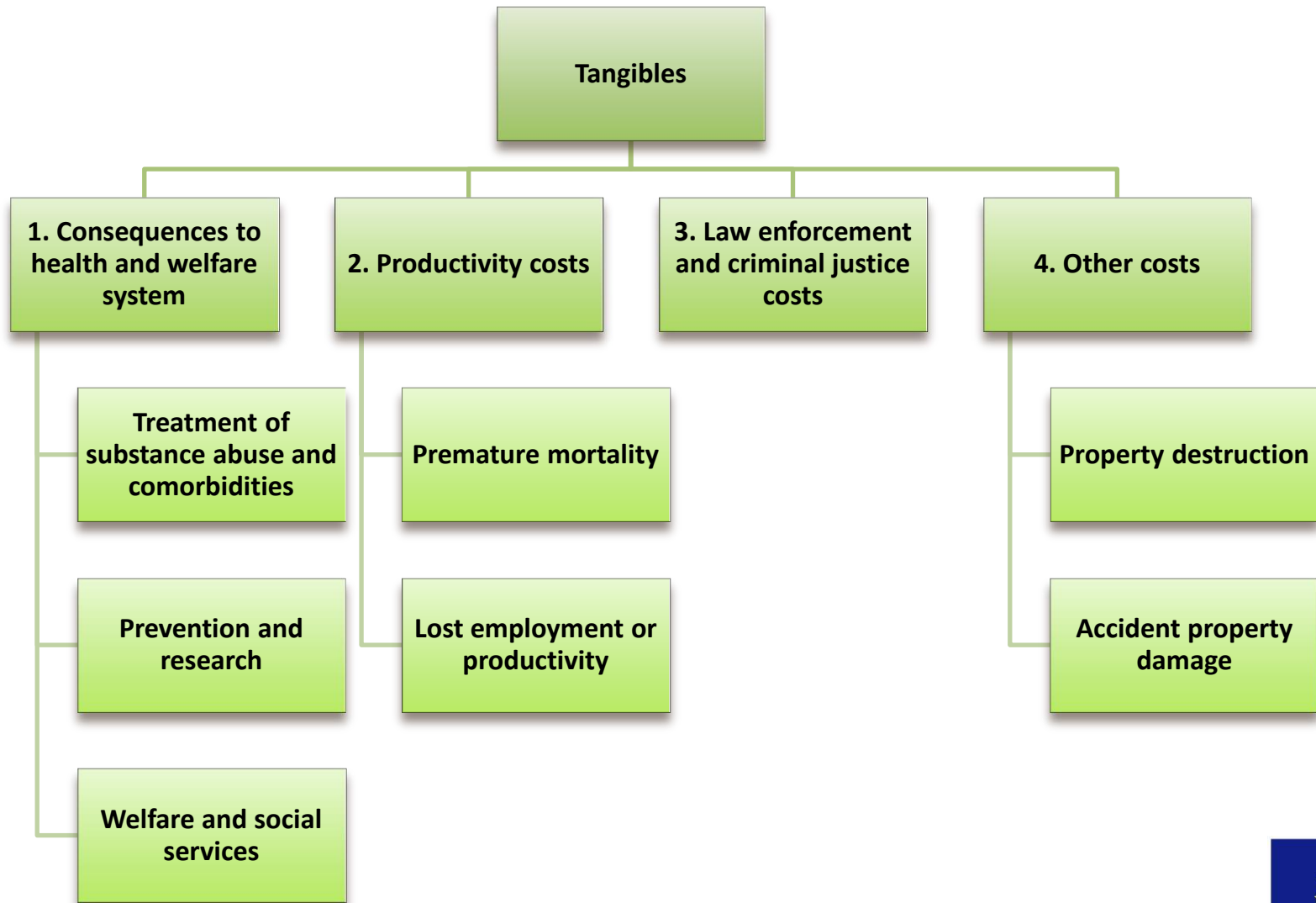
- Intangible costs

- Discount rate

- Gross vs. net cost

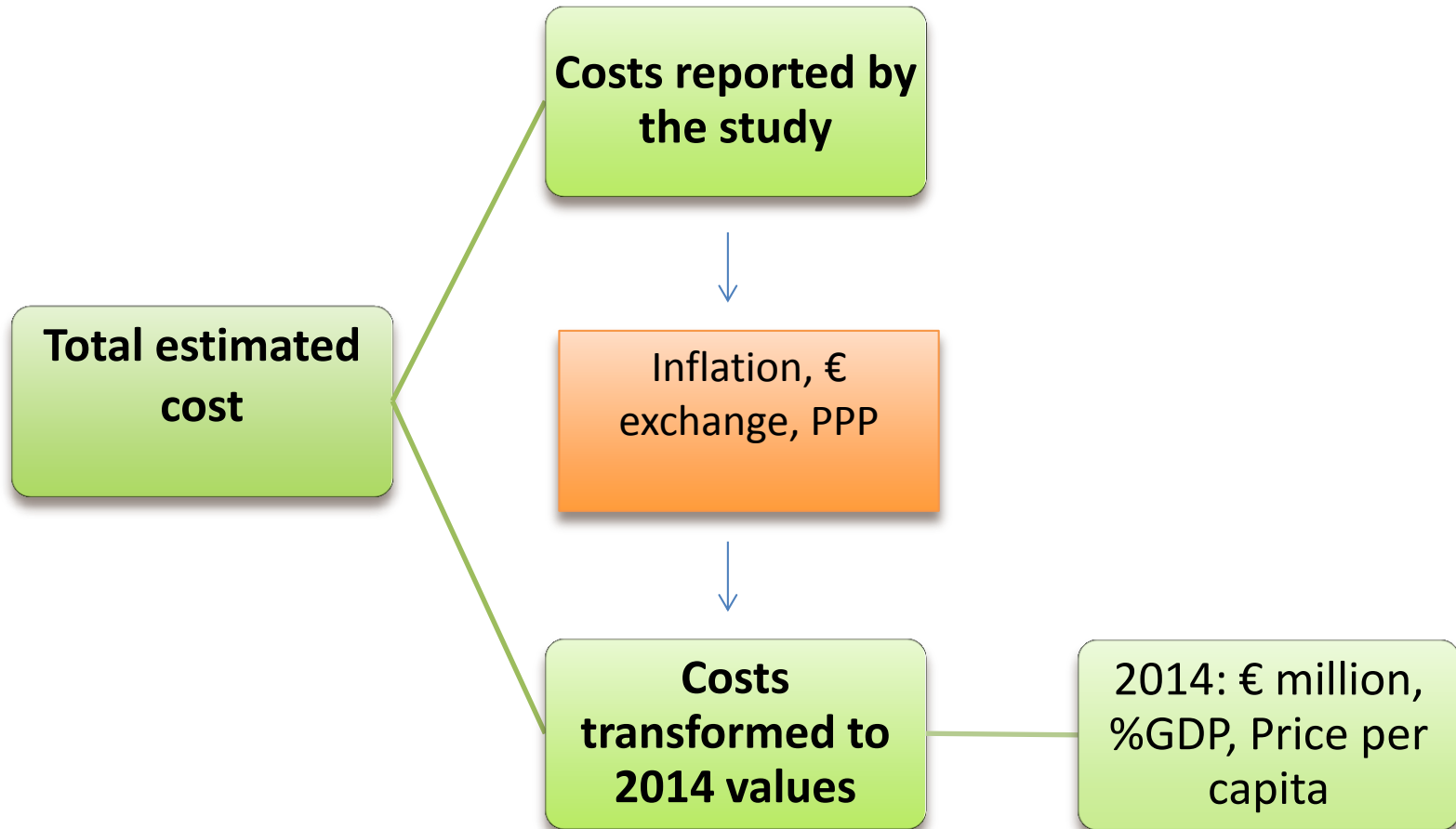


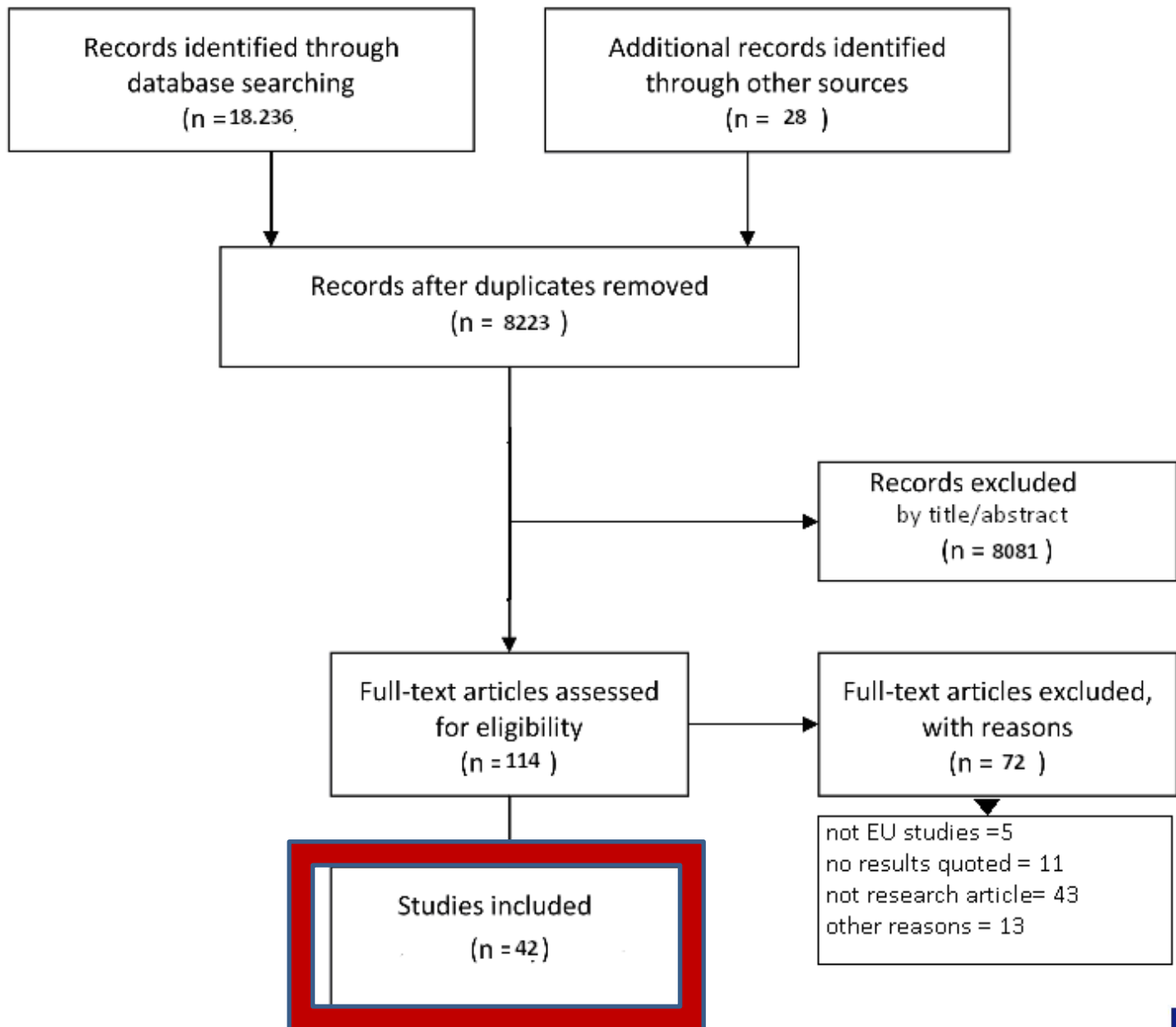
Cost components





Data extraction







Results

- Illegal Drugs : 8 studies
- Alcohol: 26 studies
- Tobacco: 8 studies





Results

Methodological characteristics

- Predominance of **prevalence estimates** (instead of incidence estimates)
- Predominance of **human capital approach** for premature death estimates
- Most of studies using **gross costs** (not applicable to tobacco or drugs)





Results

Methodological characteristics

- Discount rates
 - Illegal Drugs: only reported in one study (6%)
 - Alcohol: range 0-10% (not reported in 18 studies)
 - Tobacco: range 3-6% (not reported in 3 studies)





Results

Cost components

- **Constant inclusion of direct costs related to**
 - **Treatment of substance use**
 - **Treatment of comorbidities**





Results

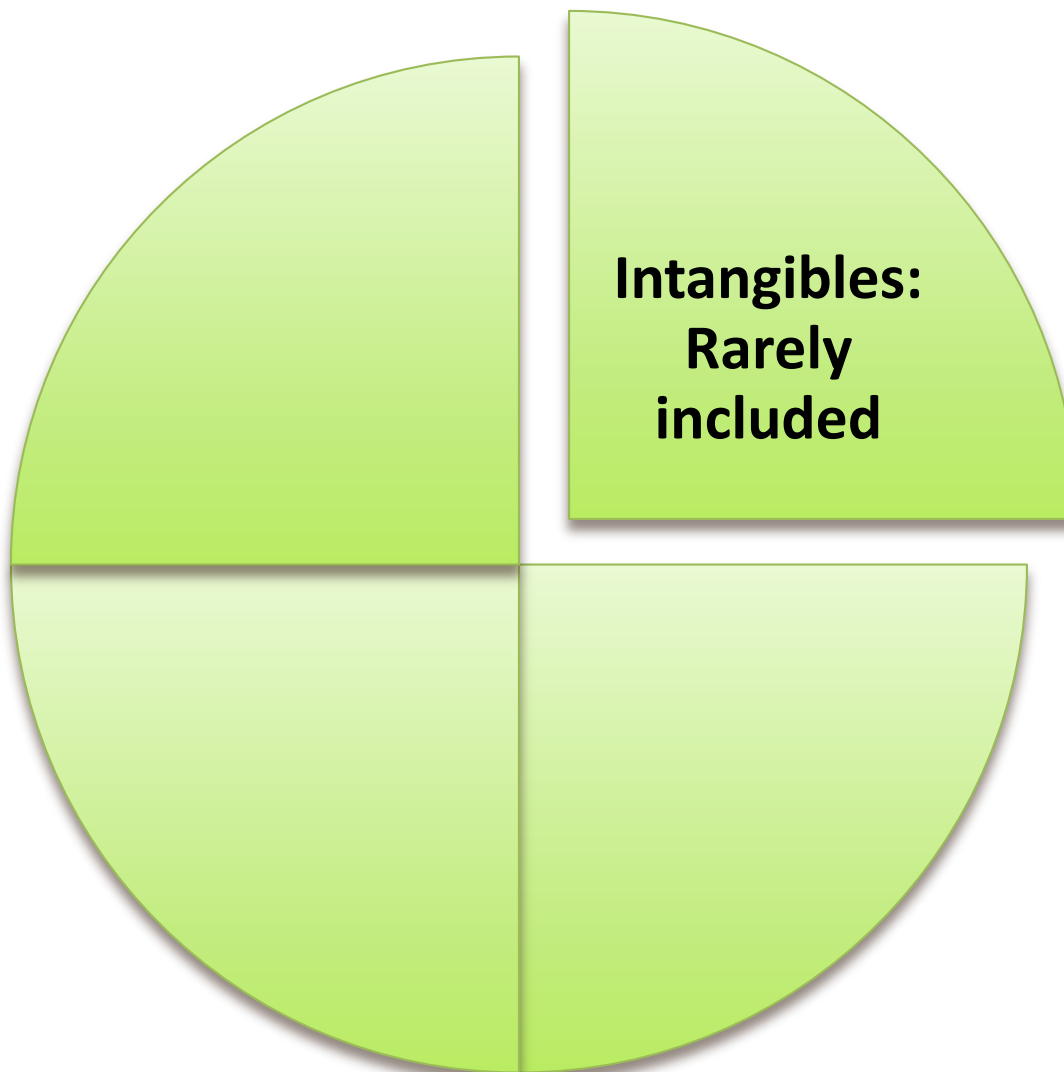
Cost components

- **Illegal Drugs** → **law enforcement and criminal justice** (6 studies), **with research and prevention** costs being also frequently included (5 studies). **Only 2 studies** assessing **indirect costs**
- **Alcohol** → the most inclusive. Studies also include non-health costs, such as **property damage or accidents**. A great majority of studies include **indirect costs, criminal justice and law enforcement**.
- **Tobacco** → **Indirect costs** are measured in the majority of studies; premature mortality is included in 4 studies and lost productivity in 5 studies.





Results





Results

| | Price per capita | | % GDP | | % Direct costs | |
|----------------------|--------------------------|-------------------------|-------------------------|-----------------------------------|--------------------------|--------------------------|
| Illegal Drugs | 0.37€ UK | 78€ Germany | 0.001% UK | 0.4% Nether- lands | 54.3% France | 100% |
| Tobacco | 10.55€ Sweden | 391€ Germany | 0.28% Sweden | 1.17% Germany | 26% Sweden | 87.8% Denmark |
| Alcohol | 26€ Portugal | 1500€ Sweden | 0.11% Italy | 3.47% Sweden | 5.7% Scotland | 80% Belgium |





Total EU cost

**Most inclusive/best
practice studies**



Price per capita



**Apply to total EU
population**





EU cost

| | Low Estimate | High estimate |
|---------------|--------------|---------------|
| Illegal Drugs | 12,500 € M | 19,000 € M |
| Alcohol | 149,000 € M | 372,000 € M |
| Tobacco | 5,300 € M | 147,000 € M |

Source: Deliverable D1.1 - Systematic Review of Existing Publications on Social Costs of Illegal drugs, Alcohol and Tobacco (forthcoming) ; Fundació Clínic per a la Recerca Biomèdica LEADER research team affiliated to the Addictions Unit of the Hospital Clínic of Barcelona.

Available shortly at <http://www.alicerap.eu/LEADER-social-costs-of-addiction.html>





% of EU GDP



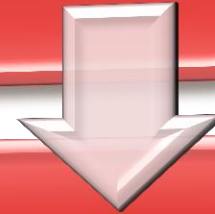
| | Low Estimate | High estimate |
|---------------|--------------|---------------|
| Illegal Drugs | 0.09% | 0.14% |
| Alcohol | 1.1% | 2.7% |
| Tobacco | 0.04% | 1.1% |



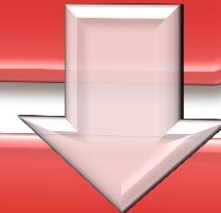


Conclusions

Big Problem



**High Methodological
Heterogeneity**



**Methodological
Guidance Needed!**







Methodologies for calculating illegal drugs' social costs: a systematic review

Vincenzo Alberto Vella

Lidia Segura García

Nuria Ibáñez Martínez

Anna García-Altés

Joan Colom Farran





Agenda

- Introduction
- Methods
- Results – Main topics of debate
 - Estimation framework: alternative general approaches
 - Definition of the “social cost” concept
 - Avoidable cost, attributable fraction and Feasible Minimum methods
 - Issues in the framework implementation
 - Matrix of costs and calculation’s open issues
- Conclusions





Introduction

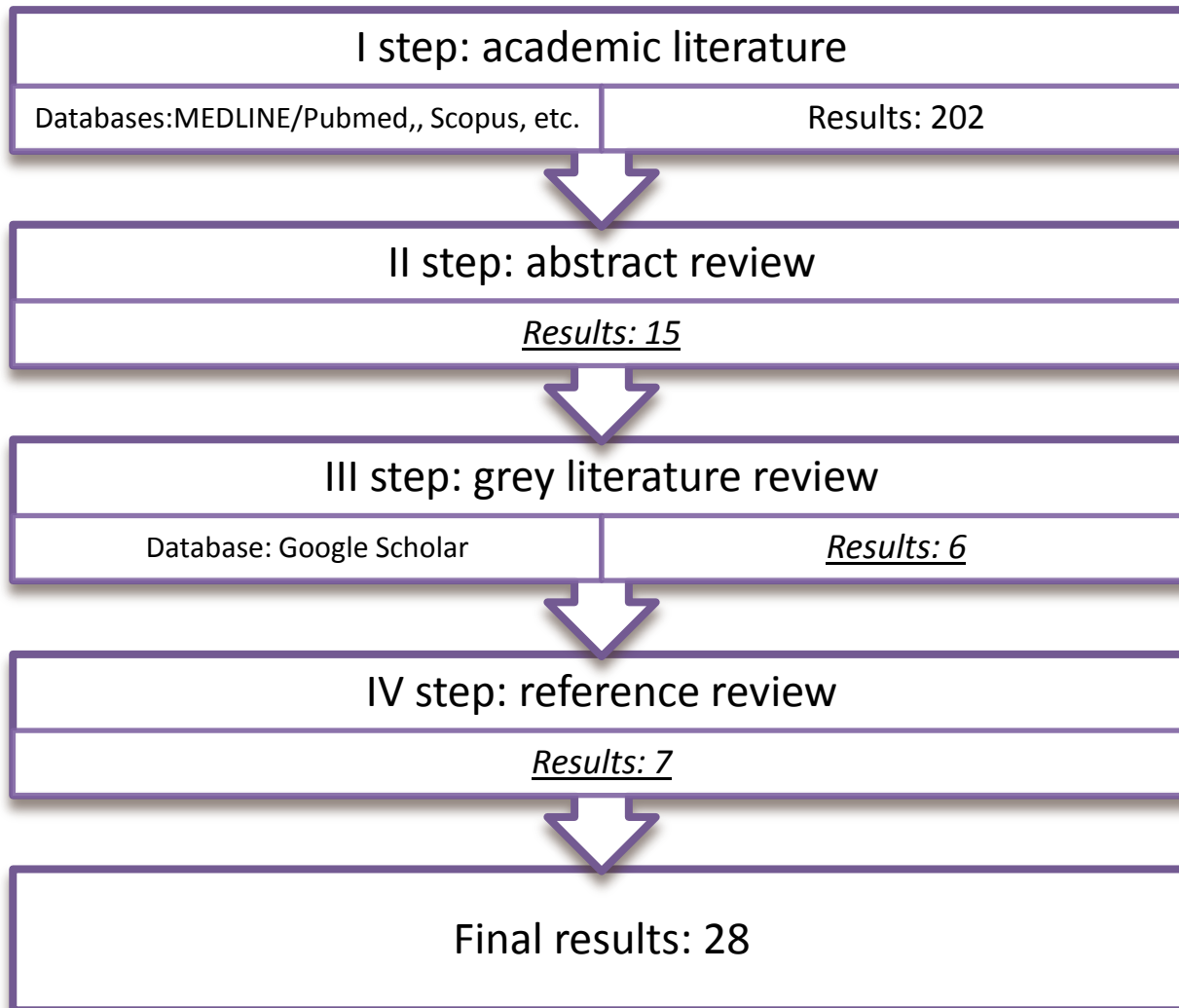
- Methods for illegal drugs' social cost estimation: a controversial field
 - “*well accepted within the scientific community*” (Kopp & Fenoglio 2001)
 - “*an exercise in hubris*” (Reuter 1999).
- Main controversies:
 - Definition of basic concepts
 - Casual nexus: drug use and social effects

Objective: review and compare published guidance documents and international standards of estimation





Methods – search strategy





Estimation framework

Alternative general approaches

- Cost of Illness (COI)
 - Calculating the value of
 - Medical resources used to diagnose and treat drugs use
 - Future losses discounted market value
 - Comparison with counterfactual: how to define it?
 - Theory of value and drug users rationality
- Averting Behaviour Method
 - Calculating expenditures to protect from a risk negative effects
 - Lack of exact and reliable estimation
- Utility Evaluation Method
 - Based on utility theory and willingness to pay
 - Associating economic values to an individual's preferences





Social cost definition

A normative concept

- 3 main categories
 - Private cost → borne only by an individual
 - Public cost, → borne by PA in contrasting illegal drugs use
 - External cost → public costs generated by the consumer, but external to her/him (externalities)
- Agreement on public and external costs, controversies on private cost



In favour → Kopp and Fenoglio, 2002

Against → Rehm, 2002





Other relevant results

- Avoidable cost: amenable by public policies
- Attributable fraction: the contribution of a risk factor to a disease or a death
- Feasible Minimum: lowest achievable level of drug use that policies should realistically aim to
 - 4 methods for its calculation:
 - Epidemiology-based methods
 - Arcadian Normal
 - Exposure-based comparators
 - Using evidences on interventions' effectiveness





Framework application issues - 1

Human capital vs. demographic approach

- Alternatives for productivity losses estimation
 - Human Capital approach (HC): actualization of the value of production losses due to substance abuse
 - Demographic approach (DA): comparing output of actual population and that of an ideal one, with same structure and no case of abuse
- Main differences: time horizon and perspective
 - HC: estimating present and future losses
 - DA: estimating present and past losses



**Common agreement: rather than alternative,
complementary**





Framework application issues - 2

Incidence vs. Prevalence

- Prevalence: “the percentage of population affected by a particular disease at a given time”
 - Cost generated by new users and former users who still face consequences of past drug use (illnesses)
- Incidence: “rate of occurrence of new cases”
 - Cost related to new users, with lifetime projection

Different objectives in analysing policy issues



**Common agreement: rather than alternative,
complementary**





Framework application issues - 3

Intangible cost

- Issues in intangible cost (IC) estimation
 - Variations does not imply changes in productivity or consumption → no benefit transfer to others
 - No market for benefits generated by IC
- Possible estimation methods:
 - Human Capital → shortcoming: considering only future earnings, exclude relevant cost: pain
 - Willingness to pay → shortcoming: estimates accuracy

Proposed approaches

1. Disley et al, 2003: limiting IC to those categories for which data are available and reliable
2. Kopp and Fenoglio 2002: excluding IC estimation





Matrix of costs

| COSTS | PRIVATE COSTS (not generally included) | SOCIAL COSTS (included in cost estimates) | | |
|-------------------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------------------------------|-----------------------------------------|-----------------------------------------------------|
| | COSTS TO USERS | COSTS TO USERS AND INDIVIDUALS | COSTS TO FEDERAL AND OTHER GOVERNEMENTS | COSTS TO BUSINESS AND OTHER PRIVATE |
| (A) Tangible costs | | | | |
| 1. Consequences to health and welfare system | | | | |
| ◦ Treatment for substance abuse | user paid insurance; out-of-pocket costs | excess insurance premiums | hospital + other health costs | contribution to health insurance |
| ◦ Treatment for comorbidities and trauma | user paid insurance; out-of-pocket costs | excess insurance | hospital + other health costs | contribution to health insurance |
| ◦ Prevention, research, health & welfare services | | | research, training, prevention, welfare | corporate research + prevention (EAP) |
| 2. Productivity costs, i.e., consequences to the workplace | | | | |
| ◦ Premature mortality | | | foregone taxes | production losses due to premature death |
| ◦ Lost employment or productivity | forgone income net of taxes | victims' forgone incomenet of taxes | foregone taxes | workman's comp., reduced productivity |
| 3. Law enforcement and criminal justice costs | | | | |
| ◦ Criminal justice response | penalties (e.g. fines) | victim's time | enforcement, court incarceration costs | victim's time (productivity loss); criminal careers |
| 4. Other costs, e.g., property destruction | | | | |
| | unreimbursed property damage | fire losses, accident property damage | accident and fire prevention, fire | fire losses + accident damage to industry |
| (B) Intangible costs (not included in estimates) | | | | |
| | pain and suffering to, user quality life years lost | suffering to dependents crime victims, + restrictions of public's legal rights to expedite | | |

Singie et al., 2005





Matrix of costs

- Healthcare costs
 - Cost for substance abuse
 - Cost for co-morbidity treatment
- Productivity cost
 - Productivity losses
 - Morbidity-lost work-time or productivity
 - Non workforce productivity losses
- Crime and law enforcement
 - Criminal justice costs
 - Drug crime's victims losses
 - Incarceration-related loss of productivity
- Other costs
 - Property destruction
 - Accidents





Conclusions

- Still many points of debates on illegal drugs' social cost estimation
- Absence of a comprehensive and complete approach → estimation heterogeneity
- Heterogeneity questioning the potential of social cost estimation as a driver for policy design and prioritisation
- LEADER review exercise as a starting point for proposing analytical approaches for future research
- 2 frameworks of reference for future research:
 - Minimum standard: proposing a standard for estimation quality and reliability
 - Ideal framework: generating the most comprehensive estimations





LEADER proposed frameworks

| | Minimum framework | Optimal Framework |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Theoretical framework | Cost of Illness | Utility Evaluation Methods |
| Private cost | Not included | Included |
| Feasible Minimum calculation | Arcadian Normal or exposure based comparators | Epidemiologic-distributional approach with scenario analysis |
| Estimation approach | Human capital & prevalence approach | Willingness to pay, Prevalence and incidence |
| Intangible cost | Not included | Included |
| Cost categories | Healthcare costs <ul style="list-style-type: none"> • Treatment for substance use • Prevention and research Productivity cost <ul style="list-style-type: none"> • Premature mortality • Lost of employment/productivity Law enforcement <ul style="list-style-type: none"> • Criminal justice costs | Healthcare costs <ul style="list-style-type: none"> • substance use treatment: • co-morbidity treatment • prevention and research Productivity costs <ul style="list-style-type: none"> • Premature mortality • Lost of employment/productivity • Non workforce productivity losses Law enforcement <ul style="list-style-type: none"> • Criminal justice costs • Drug crime's victim losses • Incarceration-related loss of productivity Intangible costs Other costs <ul style="list-style-type: none"> • Money spent on drugs and alcohol • Property losses due to crime caused by substance use |







Guidance document on the methods for estimating the social costs due to drug use

Zofia Mielecka-Kubien





Agenda

1. The purpose of the study
2. Proposed structure of the guidance document
3. What's new in the guidance document?
4. Some examples of the estimation technique in EXCEL





Purpose

Why is a new guidance document on the estimation of social costs of drugs use needed?

1. The previous one is several years old (2002)

2. There are still methodological deficiencies, inconsistencies, and gaps which have to be resolved

3. In practice everybody has to find his (her) personal way to do this - practical advice is needed



IN THE NEW GUIDANCE DOCUMENT WE PLAN:

- to fill in some existing gaps in methodology**
- to introduce a standard and internally coherent methodology for estimating the various consequences of illegal drug use**
- to propose standard way of presenting social cost results**
- to show how to proceed in practice using a standard programme (Microsoft EXCEL), including a supporting EXCEL template**





Introduction

Short, as systematic review on social costs analysis and on other guidance documents will come before the guidance document itself and the topics will be partly covered

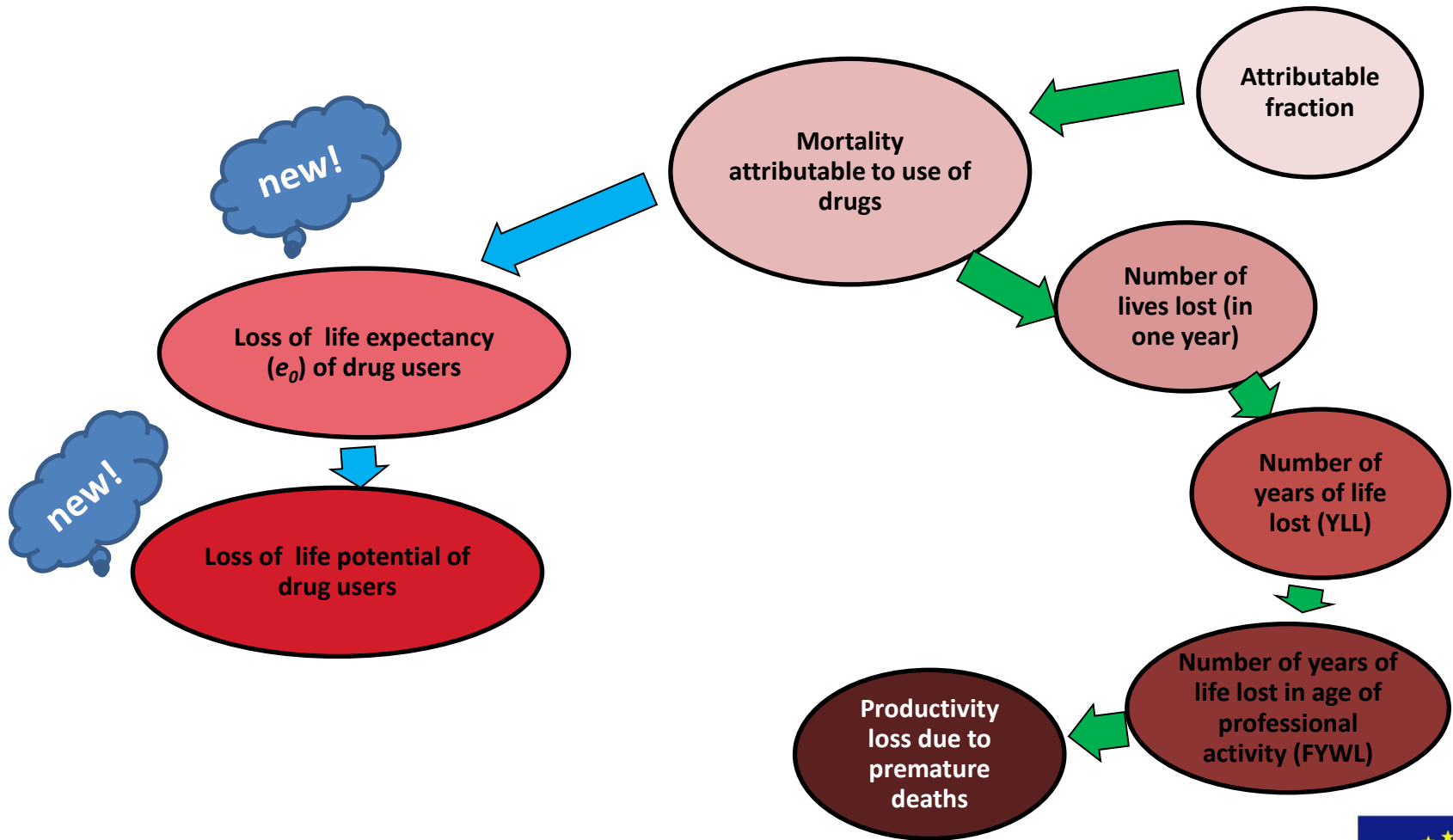
1. The reasons and applications for estimations of social costs of illegal drugs use.

2. General approach for estimating the costs (Cost of illness (COI), prevalence - based, demographic approach and other possibilities).

3. Definitions of different kinds of social costs, including avoidable costs and “harm to others”. Major types of costs included in cost estimation studies.



Estimation of premature mortality





Morbidity

Estimation of morbidity attributable to use of drugs



Additional health service costs



Productivity loss due to morbidity

new!

To fill some gaps in data on health service we suggest small scale surveys/questionnaires are included





Other costs

Estimation of crime, law enforcement and criminal justice costs

To fill some gaps in data on criminal justice costs we suggest small scale surveys/questionnaires are included



Estimation of remaining costs

Guidance in estimation costs of harm to other from illicit drugs use
(based on literature)

Guidance in estimation avoidable costs of illicit drugs use (feasible minimum, “arcadian normal”, [Hellwig’s method](#))





STANDARD WAY OF PRESENTING RESULTS TO FACILITATE COMPARISONS BETWEEN COUNTRIES



Three annexes:

Basics of sampling theory

**Basics on estimating a regression function
using EXCEL**

**Guidance on graph construction for social
cost data using EXCEL**



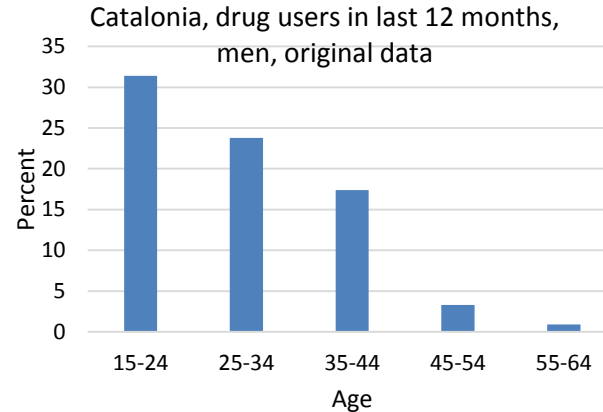


EXCEL example from ALICE-RAP project

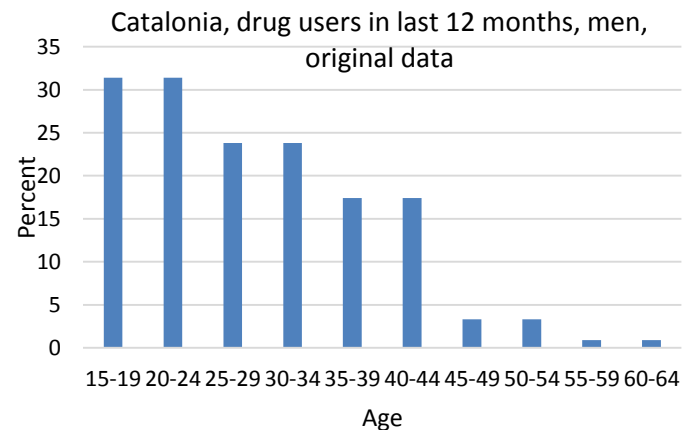
Original data

Percent of drugs users in every age group,
Catalonia, men

| Age | Men |
|-------|------|
| 15-24 | 31,4 |
| 25-34 | 23,8 |
| 35-44 | 17,4 |
| 45-54 | 3,3 |
| 55-64 | 0,9 |



Needed 5-year age groups



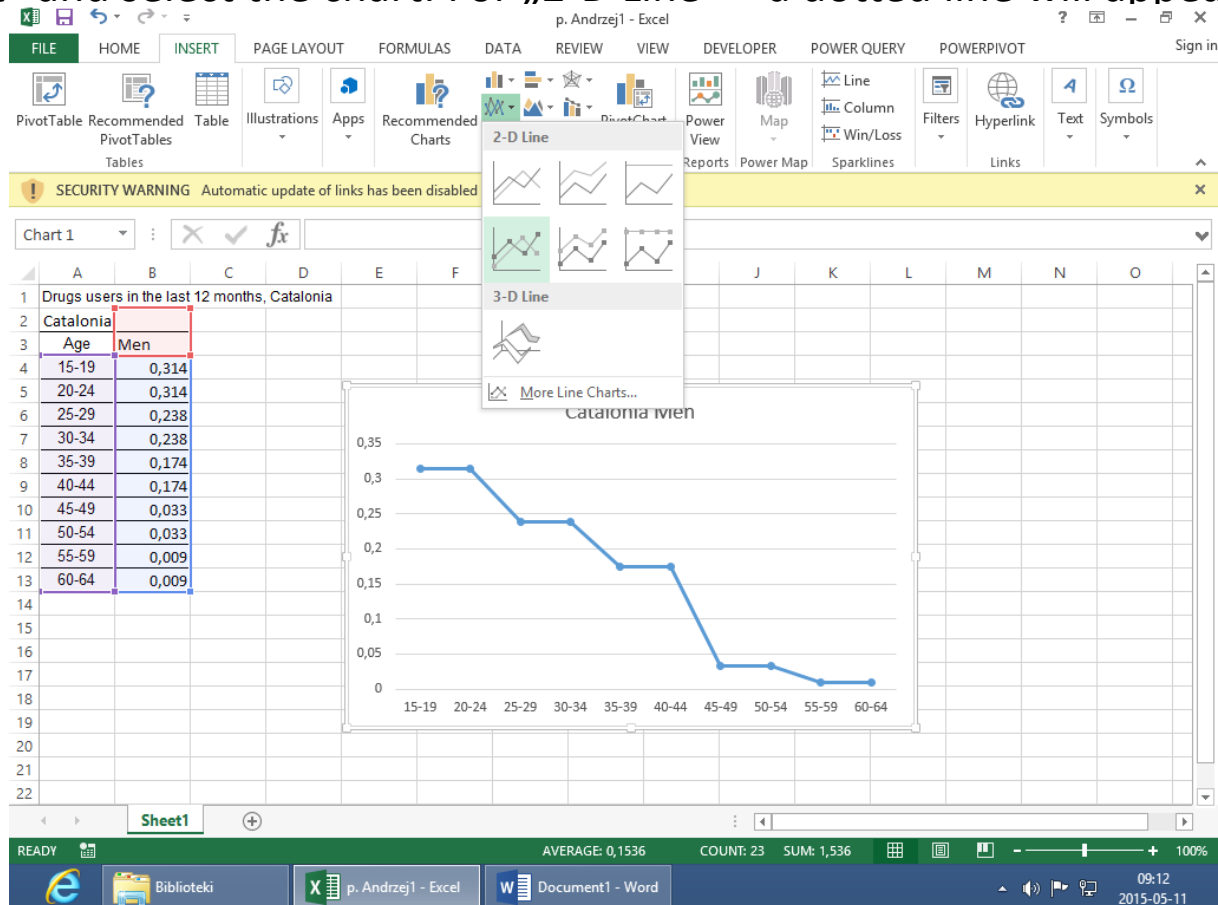
How to proceed?

Creating charts in Excel

You need basic data and their description (categories).

If the data are given in the columns, in the first column are the names of the categories, which should appear on X - axis.

Go to "insert" and select the chart. For „2-D Line” – a dotted line will appear (blue).



You can insert the title and description of X and Y-axis

The screenshot shows an Excel spreadsheet with a line chart. The chart's title is "Drugs users in the last 12 months, Catalonia" and "Men". The X-axis represents age groups, and the Y-axis represents the percentage of users. The data is as follows:

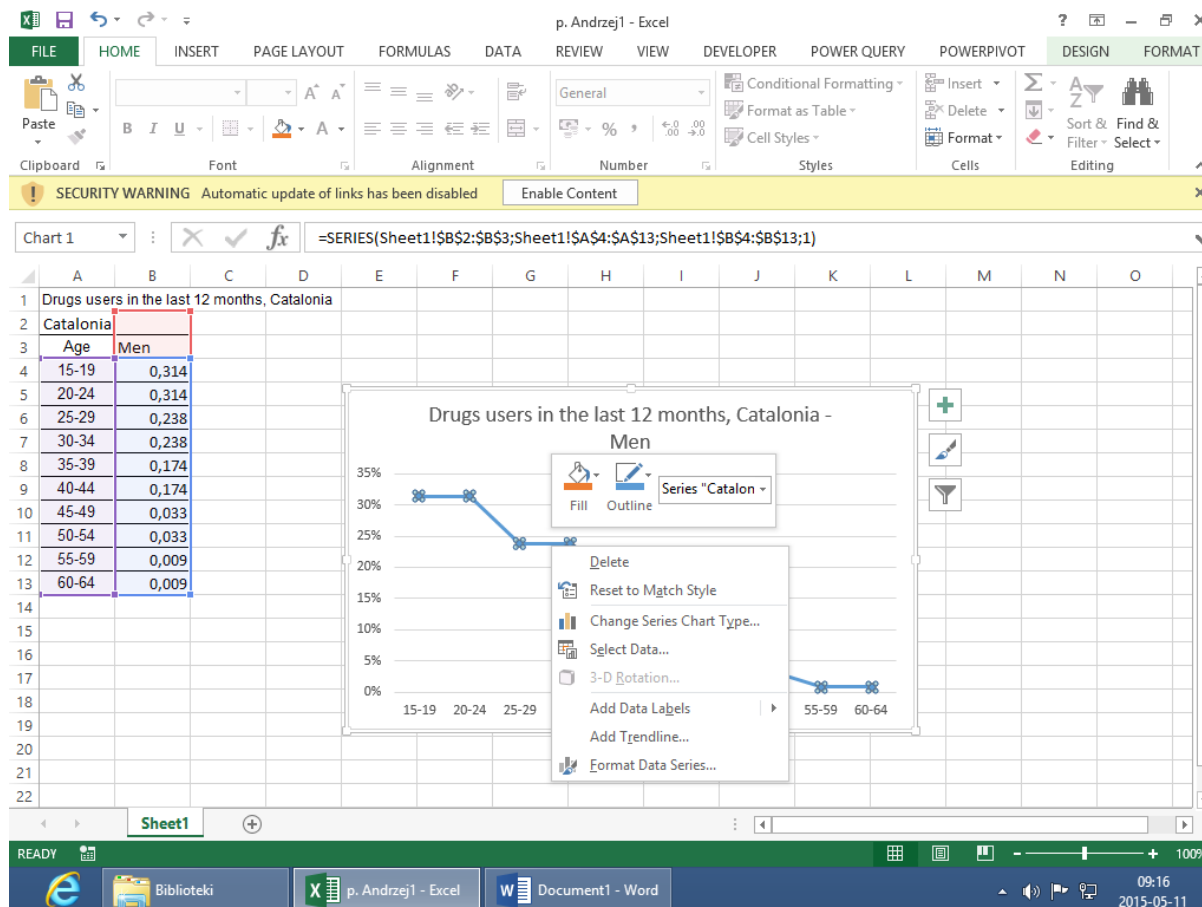
| Age | Men |
|-------|-------|
| 15-19 | 0,314 |
| 20-24 | 0,314 |
| 25-29 | 0,238 |
| 30-34 | 0,238 |
| 35-39 | 0,174 |
| 40-44 | 0,174 |
| 45-49 | 0,033 |
| 50-54 | 0,033 |
| 55-59 | 0,009 |
| 60-64 | 0,009 |

The 'Format Axis' task pane on the right shows the following settings:

- AXIS OPTIONS**
 - Display units: None
 - Show display units label on chart:
 - Logarithmic scale: Base: 10
 - Values in reverse order:
- TICK MARKS**
- LABELS**
- NUMBER**
 - Category: Percentage
 - Decimal places: 0
 - Format Code: 0,00%
 - Linked to source:



To find the best theoretical curve to describe the empirical data you should click on one point of the blue line and press the left mouse button, then choose „Add trendline”.





There are 5 possibilities available, called in EXCEL „trendline options”. There can be displayed estimated equation and the R^2 value, if you indicate it.

Try several different options till the best fit is found.

The screenshot shows an Excel spreadsheet with a chart titled "Drugs users in the last 12 months, Catalonia Men". The chart displays data points for age groups and a polynomial trendline. The task pane on the right is set to "Polynomial" with an order of 3. The equation $y = 0,001x^3 - 0,0156x^2$ and $R^2 = 0$ are displayed on the chart.

| Age | Men |
|-------|-------|
| 15-19 | 0,314 |
| 20-24 | 0,314 |
| 25-29 | 0,238 |
| 30-34 | 0,238 |
| 35-39 | 0,174 |
| 40-44 | 0,174 |
| 45-49 | 0,033 |
| 50-54 | 0,033 |
| 55-59 | 0,009 |
| 60-64 | 0,009 |

Format Trendline
TRENDLINE OPTIONS

- Polynomial Order: 3
- Power
- Moving Average Period: 2

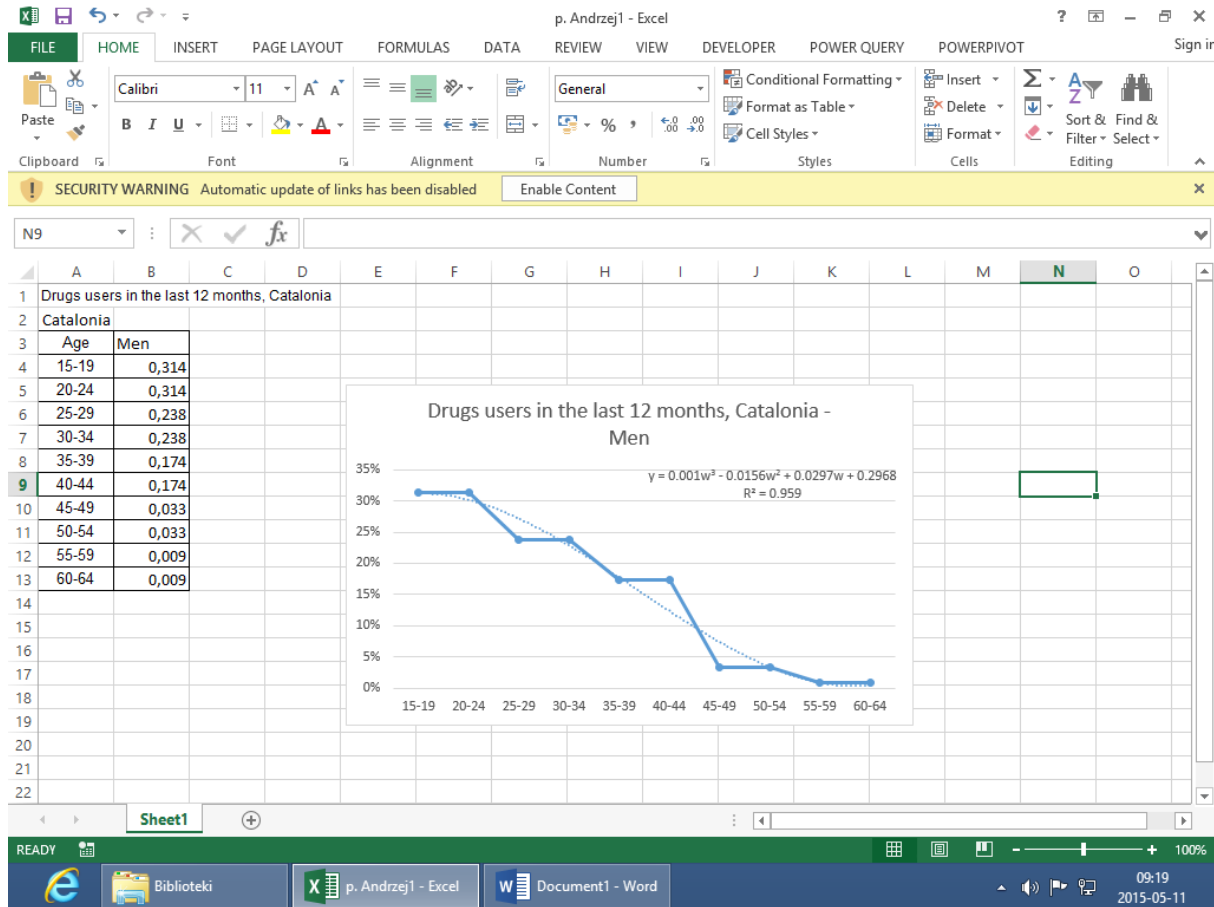
Trendline Name: Automatic Poly. (Catalonia Men) Custom

Forecast: Forward periods, Backward periods

Set Intercept

Display Equation on chart
 Display R-squared value on chart



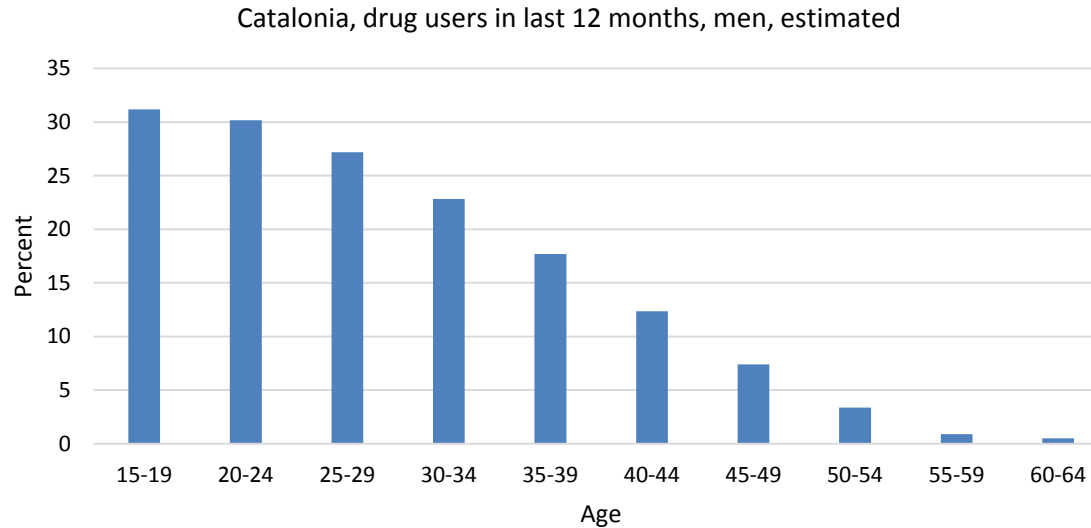


Now we know the shape of the curve and the regression equation, so theoretical values of the regression function can be calculated.





The result (theoretical values)



Advantages:

1. We can estimate percent of drugs users in every desired class of age.
2. We eliminated the influence of some of non-sampling errors, which caused irregularities in empirical data.





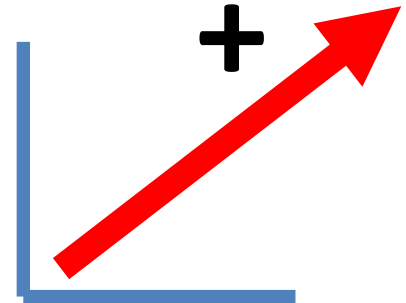
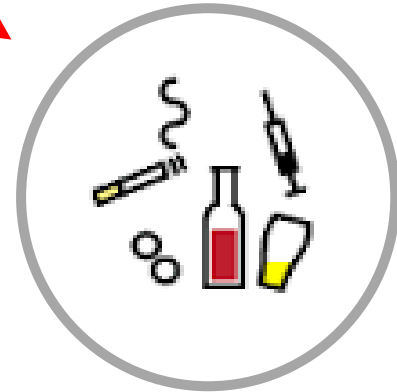
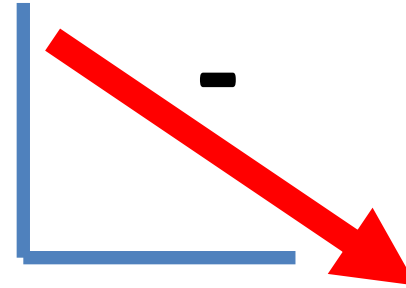


How economic crises affect use of illegal drugs, tobacco, and alcohol: a realist literature review

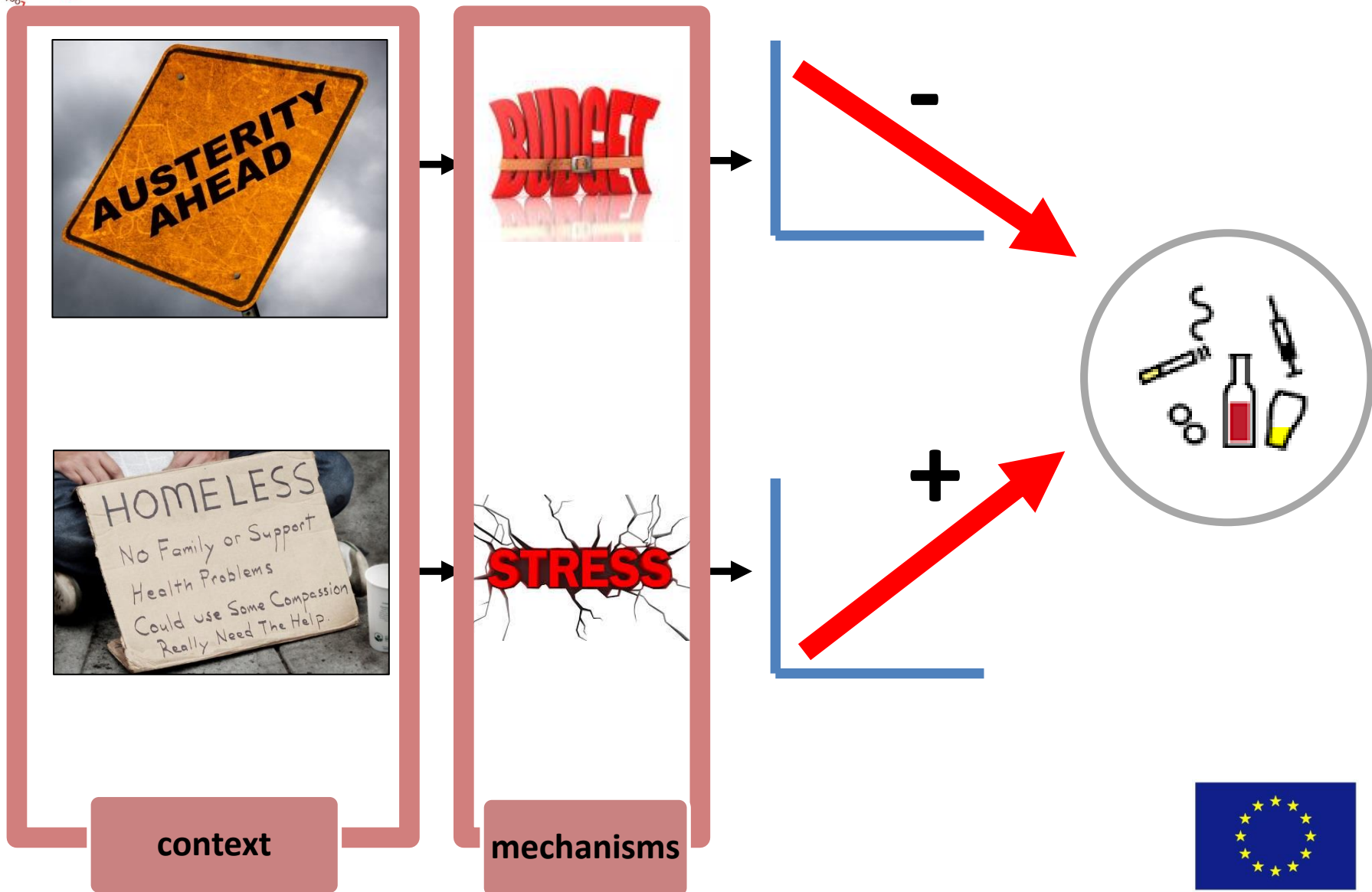
Gera Nagelhout, Moniek de Goeij, Hein de Vries,
Eileen Kaner & Paul Lemmens



First two examples

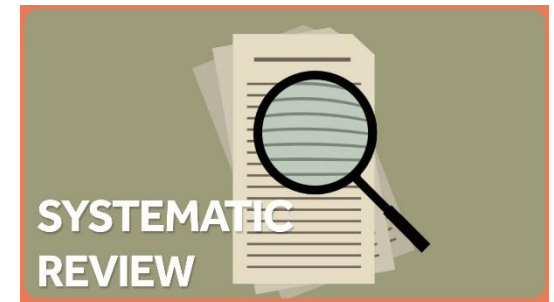


First two examples





Methods



Medical, psychological, economic, and sociological literature

20 papers about illegal drug use

27 papers on tobacco use

49 papers on alcohol (35 part of a previous review¹)

Realist reviewing method: synthesizing research to examine how complex phenomena work, and in what contexts they occur²

¹ De Goeij et al. (2015). *Social Science & Medicine*, 131, 131-146.

² Pawson (2006). *Evidence-based policy: A realist perspective*. London: Sage.



Initial theoretical framework



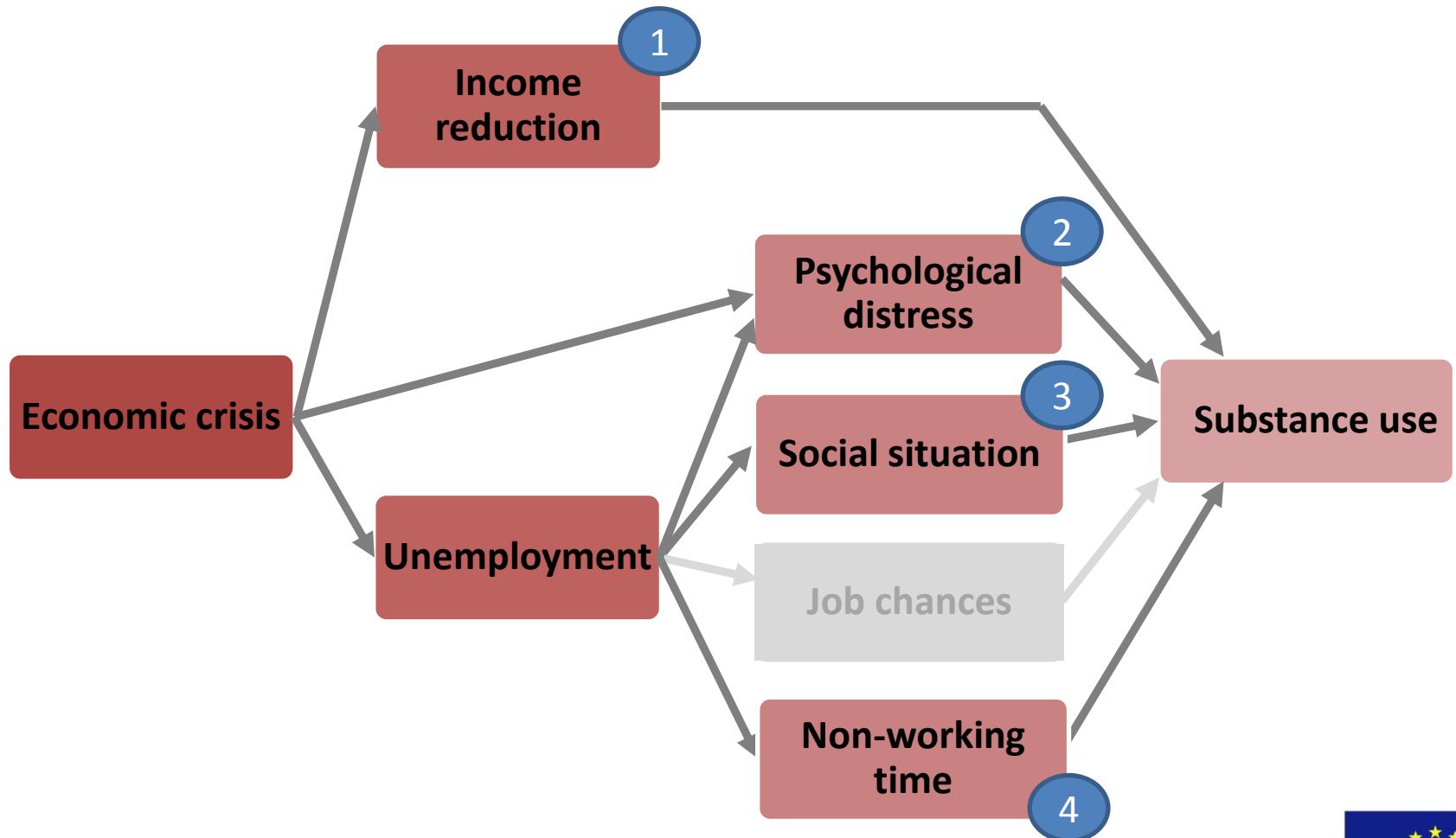


What most studies did





What some studies did





Income reduction



Supporting evidence that individual budget constraints lead to less spending on substances. Either lowering the consumption of substances or leading people to buy cheaper products

Evidence stronger for tobacco use than for illegal drug use. For illegal drug use unclear whether individual budget constraints decreased consumption, but some evidence that it could increase switching behavior

For alcohol: strong evidence in published review¹ (1990-2014), more mixed evidence in 14 studies we reviewed (2014-2015)

¹ De Goeij et al. (2015). *Social Science & Medicine*, 131, 131-146.





Psychological distress



Sufficient evidence that (fear of) losing one's job could lead to more psychological distress and that increased substance use may be a coping strategy

For illegal drug use, there was stronger evidence that illegal drug use increased psychological distress than vice versa





Social situation



Supportive evidence that losing one's job leads to a loss of social status and to social exclusion, which may be coped with by using more substances

One study about illegal drug use and one study about alcohol use

More empirical research needed





Non-working time



Evidence suggests a counter-cyclical mechanism connecting non-working time with illegal drug use: more time for illegal drug use

Evidence suggests a pro-cyclical non-working time mechanism for tobacco use: more time for smoking cessation treatment

For tobacco use the mechanism was only partly supported by the evidence

For alcohol: not often studied and mixed results

Evidence on the non-working time mechanisms inconclusive for tobacco and alcohol use





Conclusion



Counter-cyclical mechanisms dominated for illegal drug use, while both counter- and pro-cyclical mechanisms explained the relationship between economic crises and tobacco and alcohol use

Possible explanation is illegal nature of drug use (for people who already engage in illegal activities, budget constraints may not withhold them from buying substances)

Another explanation is the fact that illegal drug use is more difficult to combine with having a full-time job than tobacco use and (moderate) alcohol use





Take home messages

Jillian Reynolds





Take home messages

- A systematic review of studies on social costs of both illegal drugs, alcohol and tobacco shows that even the less inclusive approaches estimate these costs to represent a considerable proportion of the GDP of European countries.
- There is a vast heterogeneity in the methods and concepts used and included in these studies
- A major obstacle to advance the field is the lack of data





Take home messages

- One of LEADER's main challenges is to produce a tool for estimating the social cost of illegal drugs, which
 - overcomes methodological diversity,
 - is user-friendly,
 - is practical taking into account data and resource limitations,
 - Can provide low-resource intensive proxy measures to overcome major data gaps





Take home messages

- The realist literature review indicates that:
 - For illegal drugs, mechanisms which lead to increased drug use with recession dominate
 - Whereas for alcohol and tobacco the impact of recession does not appear to take one clear direction





Thank you for your attention!

www.leader-project.net



With the financial support of the:
Drug Prevention and Information Programme
of the European Union

