Cocaine treatment demands in 10 western European countries: observed trends between 2011 and 2018

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ABSTRACT

Aims   To describe cocaine treatment demand in 10 western European countries and to examine the size, direction and temporality of recent trends in the proportion of cocaine users among all clients entering treatment. **Design**   Aggregated data collected through the European Union standardized treatment demand monitoring system (TDI) between 2011 and 2018 were used. **Setting**   Belgium, England, France, Germany, Ireland, Italy, Luxembourg, Spain, Switzerland and the Netherlands. **Participants**   In total, more than 700 000 cocaine treatment records were analysed. Clients in treatment for cocaine as primary drug were predominantly male (85%), with an average age of 35 years. **Measurements**   Number of treatment episodes for substance use and for cocaine as primary or secondary drug were collected year- and country-wise. When available, powder cocaine and crack and patients with and without previous treatment were differentiated. **Findings**   Among the participating countries the share of cocaine as primary drug in treatment demand ranged between 4.7% [95% confidence interval (CI) = 4.6–4.9%] in Germany and 43.1% in Spain (95% CI = 42.6–43.5%). The general trend analysis showed a decreasing proportion of cocaine-related treatment entrants between 2011 and 2014 among all subgroups followed by a strong increase in 2015. The increase appeared stronger than for powder cocaine. Seven of 10 countries observed a recent significant increase in the proportion of treatment entrants reporting cocaine as the primary substance: Belgium [annual percentage change (APC) = 9.6%, $P < 0.01$], England (APC = 14.9%, $P < 0.05$), France (APC = 21.8%, $P < 0.01$), Ireland (APC = 28.2%, $P < 0.01$), Italy (APC = 7.8%, $P < 0.01$), Spain (APC = 7.0%, $P < 0.05$) and Switzerland (APC = 12.0%, $P < 0.05$). Trends were similar when looking at cocaine reported as primary or adjunctive substance. **Conclusions**   Despite substantial country-specific variation regarding cocaine prevalence and treatment demand, there has been an overall significant increase since 2015 in the share of cocaine-related treatment demand in western Europe.

Keywords   Cocaine, crack, Europe, Substance use disorder, treatment demand, trend.

INTRODUCTION

In Europe, concerns have recently been raised concerning the evidence of increasing health harms caused by cocaine use as a consequence of its growing availability on the illicit market [1–3]. The evidence indicates potential harmful effects of cocaine on a range of health dimensions, varying from mental health to communicable and non-communicable diseases.

Cocaine is usually available on the illicit market in the form of two main products: the first is powder cocaine, a white crystalline powder, generally prepared by extracting the crude coca paste from the coca leaf and then purified to the base form, which is then converted into a hydrochloride salt using hydrochloric acid [4]. Powder cocaine is generally snorted, but can also be dissolved in water for injection purposes. The second main cocaine product is crack, which is obtained by dissolving cocaine hydrochloride in water and making this solution alkaline using ammonia or sodium bicarbonate. This mixture is then heated, producing a solid residue. While practically insoluble in water, crack is smoked but can also be injected if a weak acid such as lemon juice is added to increase its solubility [5]. Among regular cocaine consumers, a broad distinction can be made between typically socially integrated users (with stable living conditions and regular employment) who sniff powder cocaine, and marginalized users (with high rates of homelessness, unemployment

and sometimes involved in sex work) who inject cocaine or smoke crack, sometimes alongside the use of opioids [1,6].

During recent years cocaine has been reported as the main stimulant used in numerous parts of the world, such as in America, Australia or western Europe [2]. With regard to the availability of cocaine world-wide, in 2017 coca bush cultivation and cocaine manufacture reached an all-time high [2]. In 2017, the number of cocaine seizures and the quantity seized in the European Union (EU) reached the highest levels ever recorded with a surge in the availability of high-purity cocaine for more than a decade [1]. As a consequence, in western Europe the stimulant of choice for many people who use drugs, which in recent times used to be of moderate purity and sold at varying prices, became an affordable commodity with high purity levels [5].

The increasing availability on the illicit market has been reflected in raising cocaine use prevalence. In 2017, at the global level an estimated 18 million world-wide, or nearly 0.4% of the adult population aged 15–64 years, reported past-year cocaine use. High prevalence of cocaine use was reported in Oceania (2.2%), North America (2.1%), western and central Europe (1.3%) and South America (1.0%), and these proportions have increased in recent years [2]. Recent survey data revealed a raise in last-year prevalence of cocaine use among young adults in some European countries [1]. In 2017, it was estimated that slightly more than 4 million adults (aged 15–64 years) had used the substance in the past year [3]. Between 2010 and 2016 in the WHO European Region, almost all indicators on substance use and attributable mortality decreased, with the exception of prevalence of past-year cocaine use disorder, for which a 5% increase was observed [7]. A wastewater analysis project conducted in 70 European cities in 2019 showed that cocaine residues remained highest in western and southern European cities, with increases of more than 70% since 2011. There were also signs of an increase in cocaine residues in central and eastern European cities, although smaller per-capita quantities were found in wastewater [8,9].

Another relevant harm of cocaine use relates to cocaine-related deaths. Globally in 2017, an estimated 0.32% (0.21–0.45) of all-cause deaths were associated with cocaine dependence representing a total number of 178 000 (119 000–252 000) excess all-cause deaths [10]. The number of deaths involving the use of cocaine, mainly in association with the use of alcohol or opioids, has also dramatically increased in several European countries in recent years [5,11]. In addition, cocaine is associated with non-fatal harms, including substance dependence, non-fatal overdose and poisoning, depression, psychosis, stroke and myocardial infarction, respiratory and lung disease, skin and soft tissue infection as well as bloodborne viruses and sexually transmitted infections (HIV, hepatitis C)

[10,12,13]. Trends in presentations with acute drug toxicity to emergency departments in 15 European centres between 2014 and 2017 showed an increase in incidents involving crack (from 2015) and powder cocaine (from 2017) [14].

Due to the increasing prevalence of cocaine use, more health consequences have been reported among different user groups. Substance use treatment surveillance systems in the EU indicated that after a period of decline, the overall number of cocaine first-time treatment entrants increased by 37% between 2014 and 2017 [1,15]. Recent increases in the number of people entering treatment for crack have been reported in a number of EU countries [2]. Apart from these annual monitoring reports, no specific analyses have been carried out so far at European level to study trends in treatment demand for cocaine. Nevertheless, information on the number and profile of clients entering treatment for cocaine may provide valuable insight into general developments of problem cocaine use to estimate its future burden for European drug treatment systems and ultimately develop adequate responses on different levels.

The objectives of the current study were to [1] compare national figures on different aspects of cocaine use and cocaine treatment demands and [2] estimate the size, the direction and the temporality of recent trends in the proportion of clients entering drug treatment with cocaine use in 10 western European countries. The study focused on the European region as a whole as well as on each individual country. Due to the increased availability of cocaine on the European market and its high purity levels and decreasing price, an increase in the proportion of clients entering treatment for cocaine use among the EU countries is likely to be observed.

The trends were broken down by the type of cocaine reported (powder cocaine or crack), the client's history in addiction treatment (previously treated or not) and the primary role of cocaine in the treatment demand. Studying the difference for these two types of cocaine is important, because these substances tend to be used by different user populations [16] and are associated with different clinical profiles and intensity of harms [17].

METHODS

Design

The study analysed aggregated data on cocaine treatment retrieved from national longitudinal observational studies in order to be able to observe for any changes or differences in trends over time and between countries.

Data source

The standardized national treatment demand monitoring system (TDI) collecting data on clients entering drug

treatment was used for the purposes of this study. TDI constitutes a common European data collection method and monitoring system, which gathers country-level information on an annual basis on the number and profile of clients entering drug treatment in a large variety of treatment programmes based on a standard protocol, following detailed methodological specifications and guidelines. Annually, this system provides data from 30 European countries (28 EU Member States, Norway and Turkey) to the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). This indicator represents a powerful instrument for policymakers and drug professionals to compare their national situation in drug treatment and drug problems with other EU countries. TDI data have been previously used to study trends among first heroin [18] or cannabis [19] treatment admissions, injecting drug use [20] and opioid treatment admission in ageing opioid users [21]. Detailed information on this European monitoring system has been published elsewhere [19,22]. Data from the EMCDDA's Statistical Bulletin 2019 [23], summarizing data received from the different countries, have also been used to describe the national situations regarding cocaine treatment demands as the primary substance for treatment entry and prevalence of use.

Data collection

A working group, comprised of experts from 10 western European countries for which cocaine accounted for a substantial or increasing share of treatment demands, was formed in 2018. The countries participating in this working group were: Belgium, England, France, Germany, Ireland, Italy, Luxembourg, Spain, Switzerland and the Netherlands. These 10 countries together accounted for more than 95% of the total European treatment demands for cocaine as primary substance in 2017 [23].

Measures

The participating countries agreed to share aggregated data from their national monitoring registers for the years 2011 to 2018 in order to perform trend analysis. To ensure harmonization and robust trend data, countries with less comprehensive national coverage or who encountered technical changes over time in their TDI monitoring register were requested to provide data collected among a subgroup of centres that have provided stable and reliable data over the years. Otherwise, the TDI data set providing yearly data for all centres included in their TDI monitoring was used. TDI gathers information on the primary and adjunctive substances of use at treatment admission, as well as demographic data and information concerning the treatment history of the client.

Data on the total number of clients in treatment for substance use, number of clients in treatment for cocaine as primary and cocaine as primary or secondary drug were collected. A distinction was also made between the treatment episodes of the specific substances (powder cocaine and crack) and between patients treated previously or treated for the first time for drug addiction.

The proportion of clients entering treatment for cocaine as primary substance or as primary/adjunctive substance between 2011 and 2018 were separately calculated. Proportions were calculated for clients entering treatment for the first time in their life as well as for all clients entering treatment (first-time plus previously treated). The proportion of clients reporting the use of cocaine was used in preference to absolute numbers because for some countries a subset of the total database was used, but also to enable comparisons between countries with variable treatment populations.

Annual data from 2011 onwards were included in order to focus only on the most recent trends including the period where important changes were observed in Europe on other cocaine-related indicators (mortality, prevalence, wastewater residues, supply and production). If available, data collection included 8 years up to 2018.

Data for both substances separately (powder cocaine and crack) as well as for the grouped category were used. A distinction was made between primary and adjunctive substance for the client entering treatment. The primary substance was defined as the substance that caused the most negative (social and health) consequences at the start of treatment and principally led to the treatment demand by the client. This was usually based on client self-report and (or) on the diagnosis made by a therapist, commonly using international standard instruments or clinical assessment. Adjunctive substances were defined as those substances used in addition to the primary substance, leading to additional health and/or social consequences for the client that may change the nature of the problem as assessed by the client and the therapist [22].

Analyses

First, in order to provide a global overview of the trend in the 10 countries together, the annual percentage of change in proportions was calculated for every country and weighted to obtain the European average, using the total number of cocaine treatment entrants in every country as weighting factor. A negative value for this annual percentage of change was considered a downwards trend, whereas a positive value indicated an upwards trend.

Secondly, evolution in time was examined using Joinpoint regression analysis [24] (Joinpoint Trend Analysis Software version 4.7.0.0) which describes the direction and the magnitude of trends fitting linear segments.

Joinpoint regression identifies points in time ('joinpoints') where the trend line changes significantly in magnitude or direction. The technique fits a log-linear model using Poisson regression and Monte Carlo permutation to test if a change in trend is statistically significant [25]. The model tested the hypothesis that the annual percentage of change (APC) was equal to zero. The APC assumed that rates that change at a constant percentage every year change linearly on a log scale.

The analysis was not pre-registered and the results should be considered exploratory.

RESULTS

Data set description

Table 1 describes the content of the data set received and the specifics for every participating country. In total, for all reported years and for all countries, the data set included 2 390 152 treatment demands. Three countries (Belgium, England and Switzerland) stated that a subset of data provided a more robust measurement of trends whereas the other countries provided the full national data set. Data sets between 7 and 8 years were available for most of the countries except the Netherlands, where 5 years of data were provided up to 2015. For some countries the distinction between powder cocaine and crack was not (Germany, Luxembourg) or only partially (the Netherlands, Belgium, Ireland) possible. There were also differences among countries in the way adjunctive substances were assessed, particularly in the number of adjunctive substances reported.

Figures on cocaine use and treatment demand

In total more than 700 000 treatment demand data for cocaine as primary drug were collected over the whole period. Table 2 shows the large variability among the 10 European countries regarding cocaine figures in the most recent common year (2017 or 2015 for the Netherlands): In England, Spain and Italy, approximately one client out of two who entered treatment reported problems with cocaine as primary/adjunctive substance, whereas in France only one in seven reported cocaine. Two countries had a share of cocaine as primary substance among all treatment entrants lower than 10% (France, Germany), three countries between 10 and 20% (Ireland, England, Switzerland), three countries between 20 and 30% (Belgium, Luxembourg, the Netherlands) and two countries above 30% (Italy, Spain). The mean proportion of women in treatment for cocaine as primary drug was 85% and varied between 9% (Italy) and 28% (Luxembourg), while the mean age was 35 varying between 30 for Ireland and 36 for Spain.

The proportion of crack among cocaine as primary substance treatment entrants also varied considerably: Italy, Germany, Luxembourg and Switzerland had the lowest share of crack (< 10%), two countries had proportions between 10 and 20% (Ireland, Spain) and four countries proportions above 30% (Belgium, France, the Netherlands, England). Table 2 also reveals that last-year prevalence of cocaine use among young adults (aged 15–34 years), based on surveys in the general population, varied from less than 2% in Germany, Italy, Luxembourg and Switzerland to a prevalence of 2 and 3% in Belgium, France, Ireland and Spain and up to more than 4% in England and the Netherlands.

EU trend

Figure 1 reports the average trend development (increase or decrease) among the 10 countries for both first-time and all treatment entrants for cocaine as primary/adjunctive substance and for cocaine as primary substance only. The four subgraphs present a relatively similar development. Between 2011 and 2014, a consistent slight decrease (negative percentage of change) less than 10% per year was observed for cocaine *per se* as well as for the two specific substances. From 2015 onwards, an increasing trend (positive percentage of change) in all graphs was identified. In most situations, the increase for crack (> 20%) was stronger than for powder cocaine (approximately 10%). The increase diminished between 2017 and 2018 except for cocaine as primary/adjunctive substance among first-time treatment entrants.

Trends by country

The following results show the trends in the proportion of treatment entrants for cocaine as primary/adjunctive substance (Fig. 2, Table 3) and for cocaine as primary substance (Fig. 3 and Table 3) in each participating country.

A similar pattern of change in the proportion of clients reporting cocaine as primary/adjunctive substance among all treatment entrants was observed among five countries (France, England, Ireland, Spain and Switzerland): a stable or slightly decreasing proportion until 2013–15, followed by a strong increase. In Belgium, Italy and Luxembourg the significant trend continued from the first available year of data. With regard to the Netherlands, data revealed a non-significant decrease in the trend between 2011 and 2015. However, data were missing for the most recent years. The strongest increase in the proportion of cocaine reported as the primary/adjunctive substance for treatment demand occurred in France, Ireland and Luxembourg (approximately 15–17% per year). As these countries primarily reported powder cocaine, the trend for powder cocaine

Table 1 Country-specific data set characteristics.

	Belgium	England	France	Germany	Ireland	Italy	Luxembourg	Spain	Switzerland	The Netherlands
Stable subgroup [1] or full data set [a]	1	1	2	2	2	2	2	2	1	2
First year available	2012	2011	2011	2011	2011	2012	2011	2011	2011	2011
Last year available	2018	2017	2018	2018	2018	2018	2018	2018	2018	2015
Number of years	7	7	8	8	8	7	8	8	8	5
Total number of treatment demands analysed in the data set	47011	561162	356071	579972	70832	308072	2102	388547	17756	58627
% Differentiation between powder cocaine and crack [b]	97%	100%	100%	0%	94%	100%	0%	100%	100%	78%
Characteristics of data on cocaine as adjunctive substance [c]	All substances (from 2015 onwards)	2 Adjunctive substances	1 Adjunctive substance	Not collected	3 (2011–16)/4 (2017–18) adjunctive substances	All substances	All substances	4 Adjunctive substances	All substances	All substances

[a]Stable subgroup: subgroup of centres that provided stable and reliable data during the years. Full data set: the complete data set, including all treatment centres. [b]Proportion of the data on cocaine for which a distinction between powder cocaine and crack cocaine was available. [c]How adjunctive substances are managed in the national treatment demand monitoring system (TDI) protocol.

Table 2 Treatment demand and cocaine figures in the most recent common year among the participating countries.

	Belgium (2017)	England (2017)	France (2017)	Germany (2017)	Ireland (2017)	Italy (2017)	Luxembourg (2017)	Spain (2017)	Switzerland (2017)	The Netherlands (2015)
No. of all treatment demands for illicit substance use[a]	12037[b]	118342	58077	54034	8539	46586	179	46799	4133[b]	10987
No. of cocaine as primary substance treatment demands[a]	2690[b]	20290	3988	2568	1431	15394	39	20168	539[b]	2675
% Women among cocaine as primary substance treatment demands[a]	19.8% (18.3–21.3%)	18.5% (18.0–19.1%)	20.7% (19.4–21.9%)	10.6% (9.4–11.8%)	19.0% (17.0–21.0%)	8.9% (8.4–9.3%)	28.2% (14.1–42.3%)	13.7% (13.2–14.2%)	19.5% (16.1–22.8%)	14.0% (12.7–15.3%)
Mean age among cocaine as primary substance treatment demands[a]	33.0 (32.7–33.4)	32.5 (32.4–32.7)	35.2 (34.9–35.5)	34.4 (34.2–34.7)	30.4 (30.0–30.8)	37.0 (36.9–37.2)	34.9 (32.5–37.4)	35.7 (35.5–35.8)	33.9 (33.1–34.7)	35.3 (34.9–35.7)
% Cocaine as primary/adjunctive substance among all treatment demands[c]	39.1% (38.2–40.0%)[b]	50.5% (50.1–50.8%)	15.2% (14.9–15.5%)	–	32.8% (31.8–33.8%)	48.4% (48.0–48.9%)	36.9% (29.8–43.9%)	53.4% (52.9–53.8%)	25.1% (23.8–26.4%) [b]	33.6% (32.7–34.5%)
% Cocaine as primary substance among all treatment demands[c]	22.3% (21.6–23.1%)[b]	17.5% (17.2–17.8%)	8.6%% (8.4–8.9%)	4.7% (4.6–4.9%)	16.7% (16.0–17.5%)	33.0% (32.6–33.5%)	21.8% (15.7–27.8%)	43.1% (42.6–43.5%)	13.0% (12.0–14.0%)[b]	24.3% (23.5–25.1%)
% Crack among all cocaine as primary substance treatment demands[c]	32.3% (30.6–34.1%)[b]	34.0% (33.7–34.4%)	30.8% (30.4–31.2%)	–	11.8% (11.1–12.5%)	3.4% (3.3–3.6%)	–	12.9% (12.6–13.2%)	8.1% (5.8–10.5%) [b]	37.1% (36.2–38.1%)
Last year prevalence of cocaine use among 15–34-year-olds[a]	2.9% (1.6–4.2%) (2018)	4.7% (4.2–5.4%) (2017)	3.2% (2.8–3.6%) (2017)	1.2% (0.8–1.7%) (2015)	2.9% (2.1–3.7%) (2015)	1.7% (1.2–2.2%) (2017)	0.6% (0.2%–1.0%) (2014)	2.8% (2.6–3.0%) (2017)	1,7% (1.3–2.2%) (2016)	4.5% (3.7–5.3%) (2017)

[a]Reported annually to the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) and published in the Statistical Bulletin 2019 [23] or personal communication. [b]Data from all participating units. [c]From data collected specifically for this analysis.

followed a similar trend. For crack, the data revealed a generally stronger recent increase than for powder cocaine for most of the countries. The data for England showed that crack was more frequently cited than powder cocaine as primary/adjunctive substance of use.

Figure 3 and Table 3 show a similar picture for the proportion of clients reporting cocaine as primary substance among all treatment entrants. The most recent trends revealed a significant increase for the data reported by seven countries (Belgium, Switzerland, France, Ireland, England, Italy, Spain). Results reveal that for Luxembourg and Germany the increase was not significant, whereas the trend decreased non-significantly until 2015 for the Netherlands. When a joinpoint was present, the increase started generally in 2014 or 2015. The strongest increases were observed for the data from France and Ireland.

The regression was also applied to the proportion of clients reporting cocaine as primary substance among first-time entrants (not shown). The results demonstrated a similar pattern, with a recent trend occurring in 2014–15 in the same proportion as for all treatment entrants.
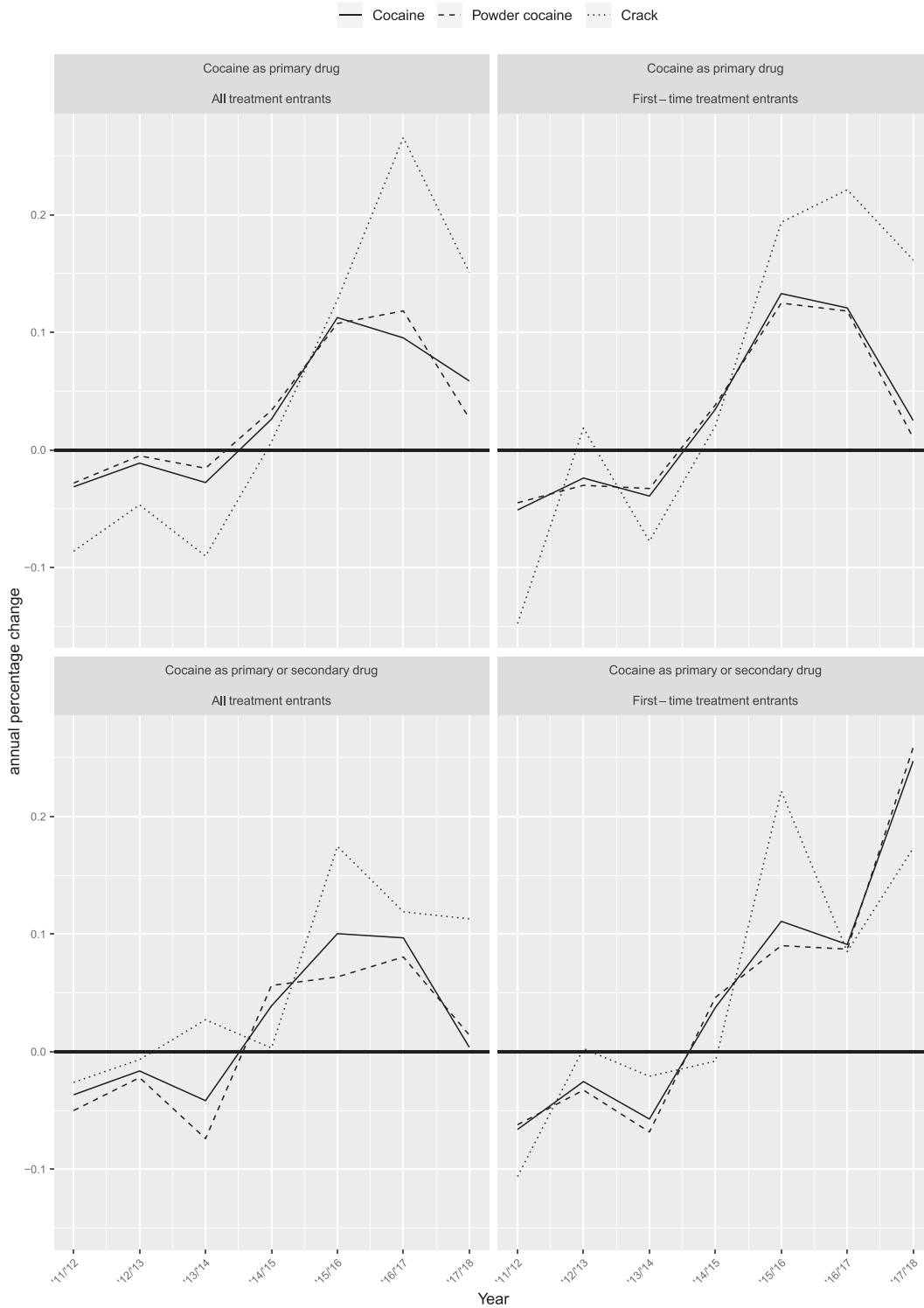
Figure I Weighted average of the annual percentage of change in the proportion of all or first-time cocaine treatment entrants for cocaine as primary/adjunctive substance or for cocaine as primary substance in 10 European countries during the period 2011–18

DISCUSSION

The current study investigated developments in cocaine treatment demands among 10 western European countries during a continuous period of 8 years while estimating the size, the direction and the temporality of recent trends for all cocaine treatment demand and for relevant subgroups. The results first reveal large disparities between countries regarding cocaine figures in terms of prevalence, proportion of cocaine in treatment demands and share of
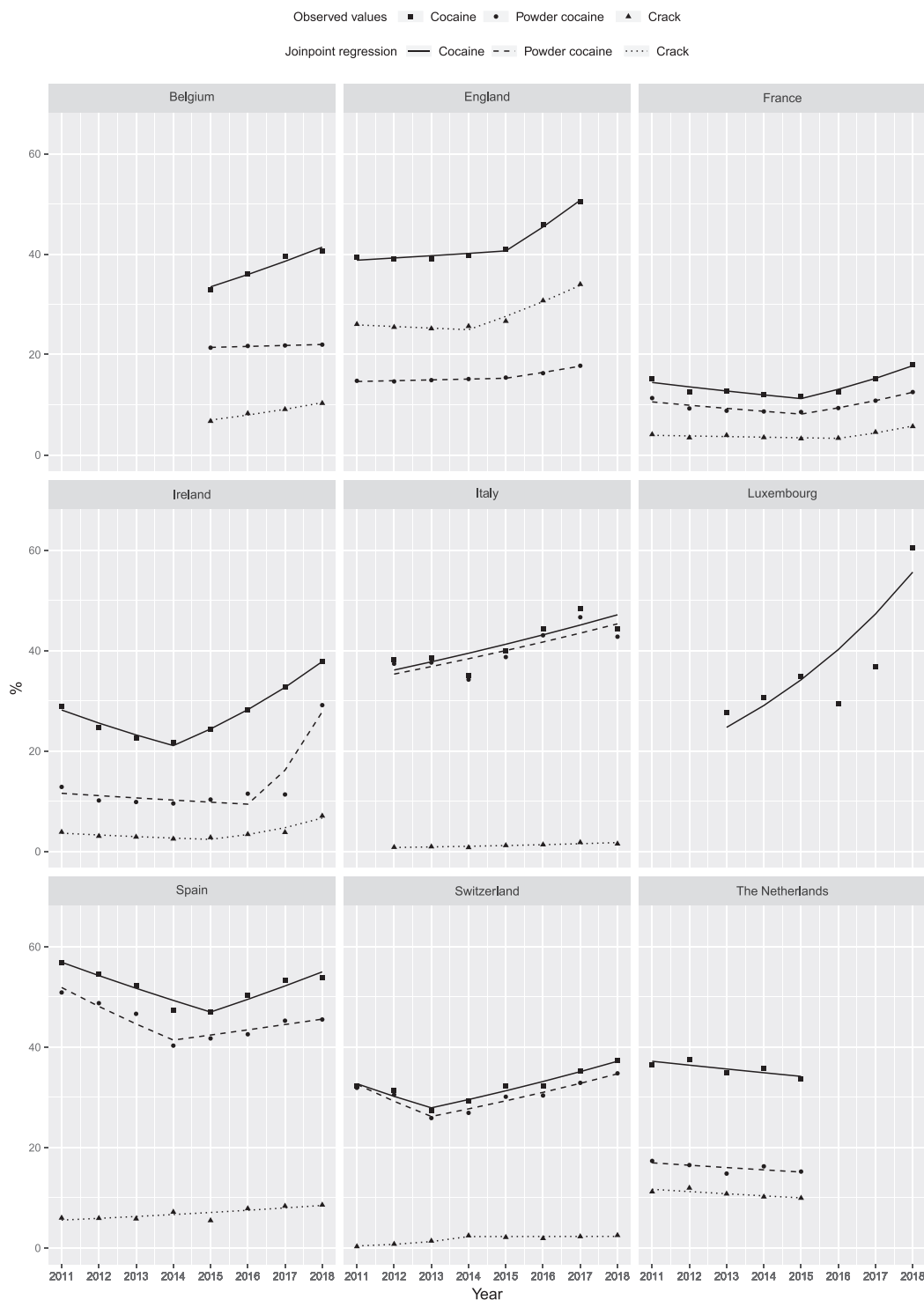
Figure 2 Joinpoint regression of the proportion of clients reporting cocaine as primary/adjunctive substance among all treatment entrants in 10 European countries, 2011–18

crack among cocaine treatment demands. Secondly, despite these differences, similar developments were observed yielding an increasing trend in the proportion of clients entering treatment for cocaine. This increase was observed in first-time clients (not treated before) as well as among all clients and for cocaine as primary/adjunctive substance

and for cocaine as primary substance. The increase concerned both powder cocaine and crack with a generally stronger increase for crack, while it appeared mainly to start in 2014–15 and to slow down in 2017–18, except for those first-time treatment clients reporting cocaine as primary or secondary drug. In this group, a continued

Table 3 Estimates from joinpoint analyses of proportion of cocaine as primary substance or cocaine as primary/adjunctive substance treatment entrants among 10 European countries, 2011–18.

Country	Substance	Cocaine as primary/adjunctive substance				Cocaine as primary substance			
		Period	*APC*	*t-value*	*P-value*	*Period*	*APC*	*t-value*	*P-value*
Belgium	Cocaine	2015–18	7.3	5.9	0.03	2012–18	9.6	17.0	0.00
	Powder cocaine	2015–18	0.9	5.3	0.03	2012–18	8.5	13.5	0.00
	Crack	2015–18	14.4	8.5	0.01	2012–15	5.4	6.5	0.02
						2015–18	13.7	19.2	0.00
England	Cocaine	2011–15	1.2	2.7	0.12	2011–15	−2.9	−5.4	0.03
		2015–17	11.7	9.3	0.01	2015–17	14.9	8.5	0.01
	Powder cocaine	2011–15	1.1	2.6	0.12	2011–15	0.9	3.1	0.09
		2015–17	7.6	5.8	0.03	2015–17	9.9	10.6	0.01
	Crack	2011–14	−1.2	−1.3	0.33	2011–15	−10.0	−10.1	0.01
		2014–17	10.6	11.3	0.01	2015–17	26.0	7.1	0.02
France	Cocaine	2011–15	−6.1	−2.5	0.08	2011–15	−3.0	−1.5	0.22
		2015–18	16.6	4.6	0.02	2015–18	21.8	8.1	0.00
	Powder cocaine	2011–15	−6.3	−2.6	0.08	2011–15	−1.5	−0.7	0.52
		2015–18	2015.3	4.2	0.02	2015–18	20.5	7.7	0.00
	Crack	2011–16	−3.3	−1.4	0.26	2011–16	−3.5	−1.5	0.23
		2016–18	32.1	3.2	0.05	2016–18	39.5	4.0	0.03
Germany	Cocaine	–	–	–	–	2011–18	0.4	0.2	0.83
Ireland	Cocaine	2011–14	−9.2	−7.9	0.00	2011–14	−4.2	−1.1	0.36
		2014–18	2015.7	22.8	0.00	2014–18	28.2	14.6	0.00
	Powder cocaine	2011–16	−4.1	−1.3	0.27	2011–14	−2.2	−0.4	0.73
		2016–18	71.9	4.9	0.02	2014–18	28.8	9.9	0.00
	Crack	2011–15	−9.9	−1.6	0.20	2011–13	−27.6	−2.5	0.09
		2015–18	40.4	4.3	0.02	2013–18	28.6	10.8	0.00
Italy	Cocaine	2012–18	4.5	3.0	0.03	2012–18	7.8	5.9	0.00
	Powder cocaine	2012–18	4.2	2.9	0.03	2012–18	7.3	5.7	0.00
	Crack	2012–18	14.4	4.3	0.01	2012–18	28.0	7.9	0.00
Luxembourg	Cocaine	2013–18	17.6	4.1	0.01	2011–18	3.7	1.8	0.12
Spain	Cocaine	2011–15	−4.7	−4.9	0.02	2011–15	−2.4	−2.6	0.08
		2015–18	5.4	3.3	0.04	2015–18	7.0	4.8	0.02
	Powder cocaine	2011–14	−7.3	−9.4	0.00	2011–15	−2.1	−2.8	0.07
		2014–18	2.4	4.1	0.02	2015–18	6.5	5.4	0.01
	Crack	2011–18	6.2	3.7	0.01	2011–15	−4.3	−1.9	0.16
						2015–18	9.9	2.6	0.08
Switzerland	Cocaine	2011–13	−7.7	−2.3	0.11	2011–14	−4.2	−1.4	0.26
		2013–18	5.9	7.9	0.00	2014–18	12.0	6.8	0.01
	Powder cocaine	2011–13	−10.3	−3.1	0.05	2011–14	−6.5	−2.1	0.13
		2013–18	5.8	7.5	0.00	2014–18	12.1	6.4	0.01
	Crack	2011–14	78.0	4.6	0.02	2011–18	19.6	3.0	0.02
		2014–18	0.4	0.1	0.92				
The Netherlands	Cocaine	2011–15	−2.1	−2.3	0.11	2011–15	−1.1	−0.8	0.50
	Powder cocaine	2011–15	−2.8	−1.7	0.18	2011–15	−3.3	−2.3	0.10
	Crack	2011–15	−3.9	−2.6	0.08	2011–15	−0.5	−0.2	0.86

APC = annual percentage change.

increase was observed for the most recent period. This trend is of concern while it risks fuelling another increase in overall numbers for cocaine treatment in the future, as some of these first-time entrants are likely to relapse and return to treatment in subsequent years.

Findings show that the observed trend could not be confirmed for Germany, the Netherlands and partly Luxembourg. This might be due to lack of recent data in the Netherlands missing the most recent trends, a small sample size of annual treatment demands in Luxembourg

compared to other larger countries and a global release of the national data assessment tool in Germany in 2016.

Although causality cannot be established based on the results observed in the current study and an important number of variables were not assessed, certain developments that were identified may explain the results. The recent exceptional increase in cocaine production, its wide availability and the development of new purchasing methods [3,26] may have direct consequences on use of cocaine and hence an increase on treatment demands. Moreover, higher purity levels of the product and changes in route of administration (i.e. injection) or frequency of use may also influence the health risks and consequences associated with the cocaine use, and therefore throw light on development in treatment demand. A more widespread and increased treatment offer may explain an easier access to treatment for cocaine drug users.

Nevertheless, the increase in the proportion of clients undergoing treatment for the first time for cocaine needs to be put into perspective with regard to the mean time lag of approximately a decade between the onset of substance use disorder and treatment-seeking. This may provide some indication on the onset when the number of people starting to use cocaine may have started to rise [5,24]. Therefore, the higher treatment demand observed in 2015 might also concern people who initiated using the substance in the early 2000s. Therefore, the recent increase in prevalence of cocaine use might lead to an even further future increase in demand for treatment among the participating European countries.

Studying trends in the profile of the cocaine users or the substance use pattern provide valuable insight for the development of appropriate service provision. Responses to the growing global problems related to the illicit use of stimulants have often been modelled on services for problem opioid use. Most people who use stimulants have little contact with treatment services, and these services do not always provide tailored and evidence-based treatment [10]. Overall, targeted programmes for cocaine users remain limited in Europe. An EMCDDA survey of more than 100 European treatment practitioners on current practices and shortcomings in responding to powder cocaine and crack-related problems in Europe indicated the need to improve access to existing drug treatment services for young cocaine users and polysubstance users using cocaine. This survey also revealed the importance to improve cooperation between drug services and mental health services; to encourage closer coordination with emergency departments; and to develop more targeted cocaine-related harm reduction responses [5].

It would be of value to focus upon the combination of substances use and polydrug use, as cocaine as an adjunctive substance is frequently recorded in combination with primary use of opioids [1]. In the United Kingdom there has been a recent increase in clients starting treatment for opiate and crack problem use [27]. In Belgium, between 2015 and 2018, clients entering treatment for opiates, cannabis and alcohol as primary substance report an increased consumption of cocaine as adjunctive substance [28].

The current study is subject to a range of limitations. First, TDI data provided information on clients entering drug treatment (for the first time in their life or after previous treatment) during the reporting year, meaning that data on clients who are in continuous treatment (i.e. who remain in treatment from one year to the next) were not provided. Secondly, treatment data collected by the national TDI systems did not cover all treatment demand and hence need to be interpreted with caution. Indeed, coverage of treatment services was not 100% and the proportion differed by country. Inclusion of treatment services not currently represented may provide different results. However, data coverage of specialized outpatient and inpatient treatment facilities is good in most countries, with lower representation concentrated among other services (e.g. general practitioners, low-threshold agencies, prisons) [15]. Thirdly, not all years were available for all countries which might also have influenced some figures. Fourthly, cocaine was only considered as the primary substance of abuse or the primary/adjunctive substance used. As there are some differences in the way national TDI protocols tackle adjunctive substances (in the total number of adjunctive substances reported), this might have impacted the comparability of these data by including more or less cocaine cases. Fifthly, the results are not representative for the whole EU, as only 10 countries volunteered and agreed to participate (including England), therefore missing the other 18 European countries. Nevertheless, those 10 countries covered a very large proportion of the European cocaine data (95%). Future studies should monitor what is happening in other countries, as there are signs that cocaine is expanding into new markets in eastern Europe [5]. Future studies might also assess other substances and specifically other stimulants (amphetamines, methamphetamines) in the analysis in order to broaden the scope of this research field by including a class of substances with similar effects.

Notwithstanding the above-mentioned limitations, this is the first international study analysing the proportion of clients entering treatment due to problems related to cocaine use and the trends that can be identified in western Europe using the same standardized data collection method.

Despite the large disparities between countries regarding the figures of cocaine prevalence and treatment demand, the findings reveal a similar significant increase in the proportion of clients reporting cocaine as substance of abuse. The trend is comparable among all or first-time
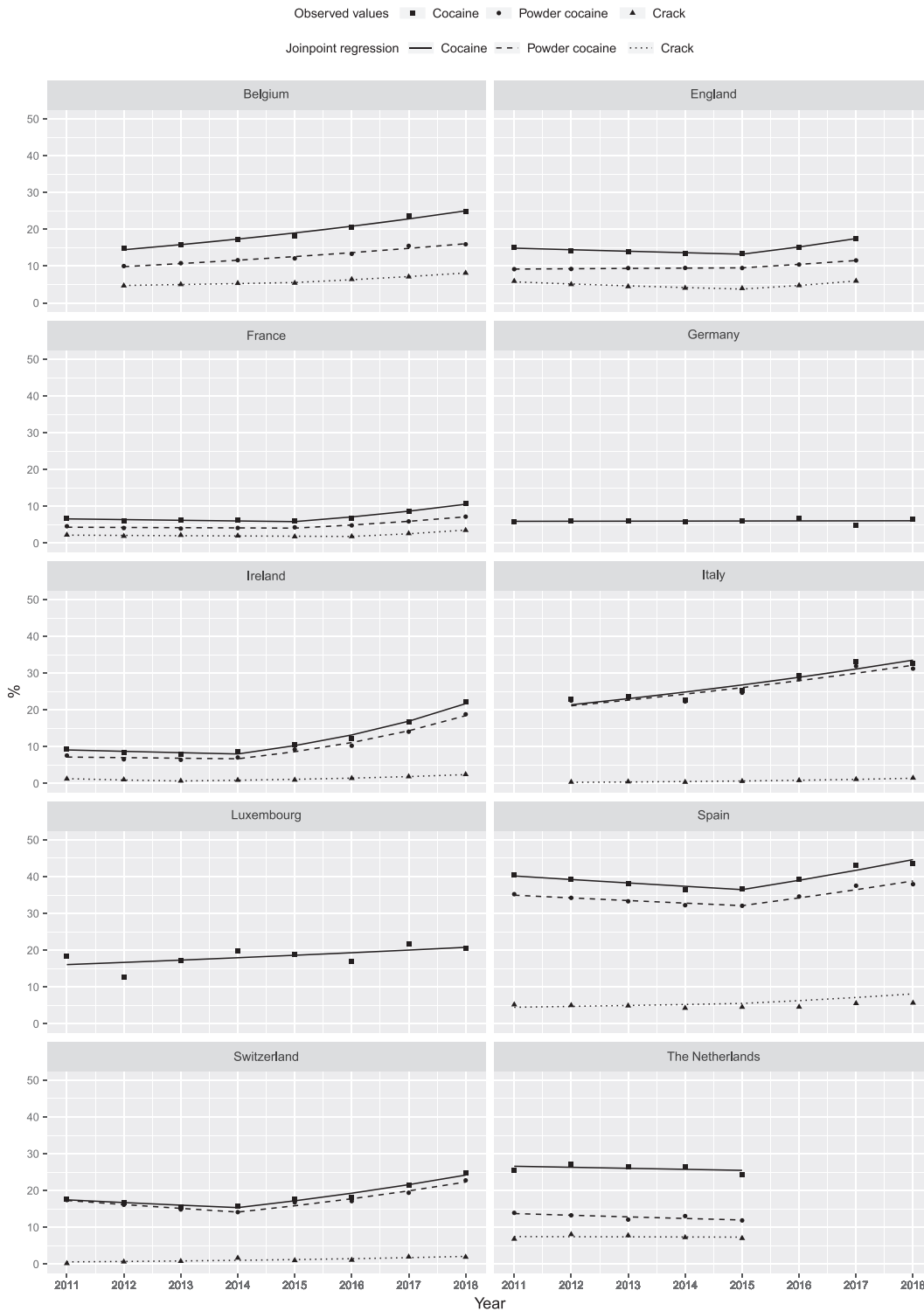
Figure 3 Joinpoint regression of the proportion of clients reporting cocaine as primary substance among all treatment entrants in 10 European countries, 2011–018

treatment entrants for both powder cocaine and crack. Finally, the trend is similar for cocaine reported as primary or adjunctive substance or for cocaine as primary substance only. In conclusion, policymakers and drug treatment

planners need to address the current high number of cocaine treatment demands in European countries by developing adapted evidence-based policies and treatment services in order to support client needs. Moreover, they

need to be prepared to deal with any possible future increased treatment needs for cocaine-related problems in western European countries.

Declaration of interests

None.

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Author contributions

Jerome Antoine: Conceptualization; data curation; formal analysis; visualization. **Nadine Berndt:** Conceptualization; data curation. **Mariana Astudillo:** Conceptualization; data curation. **Donal Cairns:** Conceptualization; data curation. **Stefan Jahr:** Conceptualization; data curation. **Andrew Jones:** Conceptualization; data curation. **Wil Kuijpers:** Conceptualization; data curation. **Noelia Llorens:** Conceptualization; data curation. **Suzi Lyons:** Conceptualization; data curation. **Etienne Maffli:** Conceptualization; data curation. **Natalia Magliocchetti:** Conceptualization; data curation. **Marta Molina Olivas:** Conceptualization; data curation. **Christophe Palle:** Conceptualization; data curation. **Larissa Schwarzkopf:** Conceptualization; data curation. **Jeroen Wisselink:** Conceptualization; data curation. **Linda Montanari:** Conceptualization.

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