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A Mixed-Method Analysis of Reports on 100 Cases of Improper Prescribing of Controlled Substances

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Abstract

Improper prescribing of controlled substances contributes to opioid addictions and deaths by overdose. Studies conducted to-date have largely lacked a theoretical framework and ignored the interaction of individual with environmental factors. We conducted a mixed-method analysis of published reports on 100 cases that occurred in the United States. An average of 17 reports (e.g., from medical boards) per case were coded for 38 dichotomous variables describing the physician,

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setting, patients, and investigation. A theory on how the case occurred was developed for each case. Explanatory typologies were developed and then validated through hierarchical cluster analysis. Most cases involved physicians who were male (88%), >40 years old (90%), non-board certified (63%), and in small private practices (97%); 54% of cases reported facts about the physician indicative of self-centered personality traits. Three explanatory typologies were validated. Increasing oversight provided by peers and trainees may help prevent improper prescribing of controlled substances.

This article advances understanding of improper prescribing of controlled substances (IPCS) through a mixed-methods analysis of a set of 100 cases in the United States (US) to identify the environmental and individual factors associated with IPCS. The paper relates findings to state and federal policies in the US, including the use of prescription drug monitoring plans (PDMPs), the controlled substance act, and professional guidelines meant to increase the adequacy of pain treatment.

The United States Drug Enforcement Agency classifies controlled substances based on evaluation of accepted medical uses and potential for abuse, misuse, and physical or psychological dependence (“Controlled Substances Act 21 U.S.C. §§ 801-971,” 2006). The most frequently prescribed controlled substances fall into category II, which includes prescription opioids such as morphine, oxycodone, hydrocodone, methadone, and fentanyl. Category II drugs are deemed to have accepted medical uses as well as high potential for abuse and severe dependence liability (21 CFR §1308.12).

Opioids are an effective means of treating patients in acute severe pain and chronic pain. In the 1990s, US policies and professional association guidelines began to focus on the undertreatment of pain, and accordingly, rates of opioid prescriptions increased: From 2007-2013, more than 200 million opioid prescriptions were written annually in the United States (Dart et al., 2015). Some evidence suggests that chronic pain is still undertreated (Institute of Medicine, 2011). Cheattle and Savage argue that “one of the barriers to effective pain management across the spectrum of pain conditions...is the clinician's fear of prescribing opioids beyond that merited by the actual risks” (Cheattle & Savage, 2012). Such fears may also be mixed with fear of criminal prosecution (Hoffmann, 2008).

Yet despite reports of physician fears regarding opioid prescribing (Dineen & DuBois, 2016), in the decade from 2002 – 2011, approximately 25 million people initiated nonmedical use of prescription opioids (Dart et al., 2015). In 2010, deaths attributed to nonmedical use of prescription opioids exceeded 16,000 (Dart et al., 2015). Most people who abuse prescription opioids obtain them from family members or friends who received a prescription (SAMHSA, 2014). However, among those who abuse prescription opioids more than 200 days per year, physicians are the most common direct source (Jones, Paulozzi, & Mack, 2014).

IPCS is a leading cause of physician review by disciplinary committees (Arora, Douglas, & Dorr Goold, 2014). To find a physician guilty of a criminal violation, prosecutors must show that the physician knowingly or intentionally prescribed a controlled substance outside of the “usual course” of professional practice, rather than for a “legitimate medical purpose”

("Controlled Substances Act 21 U.S.C. §§ 801-971," 2006). However, medical boards can take disciplinary action against a physician for IPCS if the prescribing simply falls outside of standards of practice (Goldenbaum et al., 2008).

The American Medical Association (AMA) has adopted a "4D framework" to elucidate how IPCS occurs and to establish culpability. The 4Ds are: *dated* physicians misprescribe due to obsolete information; *disabled* physicians are impaired by their own use of psychoactive drugs; *dishonest* physicians use their license to deal drugs; and *duped* physicians are tricked into prescribing medically unnecessary opioids (Council on Scientific Affairs, 1982; Wesson & Smith, 1990). The last category in this list suggests that a physician may make a good faith effort to practice according to standards of care, yet be "duped" by a clever patient into behaving in a manner that creates risk of criminal prosecution or loss of medical licensure (Dineen & DuBois, 2016)

It is unclear to what degree this typology is evidence-based. Moreover, insofar as this typology aspires to be explanatory, it falls short as it ignores completely environmental factors that might help to explain misprescribing. Nevertheless, it has been used widely since the early 1980s to categorize physicians who improperly prescribe opioids (Hellmann, 2009; Heumann, Pinaire, & Burger, 2009; Heumann, Pinaire, & Lerman, 2007-2008; Hoffman, 2008-2009; Hoffman & Tarzian, 2003; Wesson & Smith, 1990).

Very few studies of IPCS have been conducted. Most studies of professional lapses by physicians focus on factors associated with any criminal activity by physicians (Jung, Lurie, & Wolfe, 2006), or on general disciplinary action taken against physicians (Arora et al., 2014), or on physicians who have a substance use disorder (SUD), regardless whether they engaged in IPCS (Holtman, 2007). Goldenbaum and colleagues conducted the largest study to-date focused specifically on IPCS. They investigated criminal and administrative cases involving charges made against 725 physicians from 1998-2006 for opioid prescribing offenses drawing from agency databases, published news accounts, and websites. Their study focused on describing physician characteristics: Most worked in general practice/family medicine or internal medicine (63%), were male (89%) and were over 45 years old (79%) (Goldenbaum et al., 2008).

The study by Goldenbaum and colleagues remains the most detailed study of IPCS conducted to-date. However, it did not systematically examine environmental factors that might be correlated with IPCS. A review article by DuBois and colleagues identified 10 environmental factors that may be correlated with professional wrongdoing in medicine (DuBois, et al., 2012). By reviewing empirical studies and actual cases, a series of environmental factors were identified that may contribute to wrongdoing by providing motive, means, or opportunity—three elements common to general forensic theory (Jones, 2010; Maguire, Reiner, & Morgan, 2007). Such factors include playing conflicting roles such as physician and medical review board member (Grover, 1993; Levine, 1992); financial rewards for wrongdoing (Jennings, 2006; Rodwin, 1993); the involvement of others who benefit from the wrongdoing (Victor, Trevino, & Shapiro, 1993); working in an environment that penalizes people for doing what is right (Hegarty & Sims H, 1978; Jansen & Von Glinow, 1985); organizational injustice (Greenberg, 1993; Keith-Spiegel & Koocher, 2005;

Martinson, Anderson, Crain, & De Vries, 2006); ambiguous professional norms (Davis, 2003; DuBois & Dueker, 2009; Meyer & Jr., 2002; Shah, Whittle, Wilfond, Gensler, & Wendler, 2004; Simonton, 2003); particularly vulnerable patients (Bandura, Underwood, & Fromson, 1975; Zimbardo, 2007); oversight failures (Bramstedt & Kassimatis, 2004; Marshall, 1999); and being in a position of authority over co-workers such that ordinary oversight is reduced (Milgram, 1965; Trevino, Butterfield, & McCabe, 1998).

Prior studies also did not examine the potential role played by self-serving personalities or self-serving cognitive biases—e.g., biases that involve blaming others for wrongdoing or ignoring the welfare of others (Samenow, 2001; Wallinius, Johansson, Larden, & Dernevik, 2011). In part, these omissions may be due to the extreme difficulty of studying professional lapses: Many cases go unreported, and those that are reported and investigated typically leave in their wake reports of uneven detail. For example, medical boards reports are focused on evaluating an individual's practice of medicine; they rarely describe in detail individual and environmental factors that do not pertain to establishing whether a physician violated laws or standards of practice.

Finally, several factors have changed since 2006, the final year in Goldenbaum et al's sample. From 2001 to 2012, the number of U.S. states with Prescription Drug Monitoring Plan (PDMP) legislation increased from 16 to 49 (Clark, Eadie, Kreiner, & Strickler, 2012). The number of deaths due to prescription opioid abuses has increased 3.4-fold from 2001 – 2014, with over 14,000 deaths in 2014 (Centers for Disease Control and Prevention, 2016). Prescription opioid SUDs have also increasingly been recognized as requiring medical treatment (Kreek et al., 2012) and new prescribing options exist for physicians working in office settings, including replacement therapy (Arfken, Johanson, di Menza, & Schuster, 2010); such factors may affect when a prescription is viewed as inappropriate.

This study aimed to examine the environmental and individual factors associated with IPCS by coding cases that were well described in 5 or more published reports—a number of reports that the study team's prior research projects found to be sufficient to identify relevant individual and environmental factors (Authors, 2013a; Authors, 2013b). The purpose was to characterize such cases and to develop explanatory typologies that would provide a deeper understanding of the different ways that diverse factors combine to account for cases of IPCS.

Methods

This project used a multi-phased, mixed-method approach to case analysis. Case analysis is a preferred method when prospective, randomized designs are not possible (e.g., it would be unethical and difficult to randomize physicians to diverse conditions intended to induce IPCS) (George & Bennett, 2005). This study is best described as an exploratory study aimed to understand the “causes of effects” (Bennett & Elman, 2006): It begins with 100 cases of IPCS and examines each case individually to understand its attributes and how it arose; it then examines the set (N=100) as a whole to examine whether typologies or species of causal patterns manifest. Such an approach is limited in its ability to make inferences about frequencies in the larger population. However, it is particularly well-suited for studying

phenomena that are socially complex and likely to be caused by diverse clusters of causal conditions—something Bennett and George (2005) define as “equifinality”.

Research Design

Our approach involved five sequential components:

1. Identifying and selecting cases through systematic reviews of documents from medical boards, court records, newspapers, and journals.
2. Conducting a qualitative content analysis of the documents to identify case attributes. Roller and Lavrakas (2015) describe this as “Phase 1 Data Generation” coding, which involves coding both manifest and latent content in existing texts.
3. Developing a theory of how each case occurred using forensic theory. Roller and Lavrakas (2015) describe this as “Phase 2 Data Analysis,” which involves interpreting the data in the light of theory.
4. Generating explanatory typologies (Elman, 2005) that describe *types* of cases based on how variables appear in meaningful combinations consistent with forensic theory.
5. Validating the typologies using descriptive and exploratory statistics.

Below we describe each of these five methodological components.

1. Identifying and Selecting Cases—In order to identify both cases and all documents associated with cases, we conducted two rounds of systematic searches of a database (LexisNexis Law) that contains medical board reports, regulatory, criminal and civil proceedings, journal articles, and investigative journalism reports.

To identify cases that met our inclusion criteria, we consulted two law librarians to develop the following search terms to use in LexisNexis Law: ((physician or doc or doctor or dr or surgeon or psychiatrist or pediatrician) w/20 (charg! or accus! or convict! or revok! or suspen! or disciplin! or fine! or sanction! or probation or censure! or arrest! or guilty)) w/40 ((drug! or oxyco! or prescription or painkiller or opioid or opiate or amphetamin! or marijuana! or steroid! or benzo!) w/20 (distrib! or diver! or sell! or trad! or traffic! or prescrib! or overdos!)). We restricted the search date range from July 1, 2008 to June 30, 2013. We additionally focused only on cases involving physicians practicing in the U.S. because this provided a uniform context in which to analyze the interaction of professional standards with other variables of interest.

The search returned 4626 records. A team member with training in law and medical ethics reviewed all records: The majority of records did not meet inclusion criteria (e.g., they did not occur in the US, they did not fit our date range, or there was no accusation of IPCS by a physician); 667 records were relevant. The 667 relevant records involved 284 distinct cases (that is, many cases were described in more than one record).

To ensure that available records provided adequate descriptions of the physician and work environment, we required that cases be described in 5 or more independent sources. In past studies by the team, the number of case references did not correlate with severity of wrongdoing; thus the potential for selection bias was modest compared to gains in information about the environment of practice (Authors 2013a). Of the 284 distinct cases identified in our literature review, 199 were described in at least 5 reports.

From the resulting 199 cases, 100 cases were randomly selected. A sample of 100 is generally considered adequate for qualitative content analysis studies to identify relevant variables and establish trustworthy patterns (Vogt, Vogt, Gardner, & Haeffele, 2014). Restricting our focus to 100 cases was also important for reasons of feasibility; reading and coding all literature on a case ordinarily requires 20 or more hours.

Once a case was selected, a second literature review was conducted using the physician's name to identify all available records of the case. The mean number of reports or records consulted per case was 17 (SD = 12, range = 5-64). In 100% of cases newspaper articles and either medical board reports (88%) or court records (69%) were consulted; in 57% of cases, both medical board reports and court records were consulted.

2. Qualitative Content Analysis: Generating Case Attributes Data—Phase 1 of qualitative content analysis of existing texts involves generating data through coding (Roller & Lavrakas, 2015). Our coding system was deductive insofar as most codes came from the research team's prior literature reviews (Authors 2012a and 2012b) and coding of 150 cases of professional breaches (Authors 2013a and 2013b). It was inductive insofar as several new codes were identified in the process of coding IPCS cases. We developed a case datasheet in Excel that included 15 attributes describing the setting and social dynamics, 4 describing the patients, 9 describing the investigation and consequences, and 18 describing the physician. We coded case attributes dichotomously as present or absent.

Operationalizing most variables was straightforward (such as physician gender or whether the physician had collaborators in the wrongdoing); other variables required detailed coding instructions, which were provided in an Excel spreadsheet used by coders. For example, “self-centered personality traits” meant that the literature on a case provided clear evidence that the prescribing physician exhibited at least 2 criteria needed to make a diagnosis of antisocial or narcissistic personality as defined in the DSM-IV-TR (American Psychiatric Association, 2000). Such criteria included a pattern of illegal activity apart from the IPCS, deceitfulness (apart from defending oneself against IPCS accusations), a reckless disregard for the well-being of others (e.g., evidenced by the behavior persisting after 1 or more deaths from IPCS or by routinely prescribing high doses of opioids to individuals with SUDs without conducting a medical exam or history), or evidencing a lack of remorse (e.g., by making statements blaming the victims rather than assuming responsibility). As a matter of procedure, we did not use this code in combination with potentially confounding codes such as “substance use disorder.” Our purpose was not to make diagnoses, but rather to standardize the coding of material in the literature that spoke to a cluster of traits pertaining to “self-centeredness”—a variable that was missing from some past studies of professional wrongdoing, but was conspicuous in many of the IPCS cases. In making these

determinations we drew upon all sources of information. In our experience, medical board and court records often focus on determining *what* happened, whereas investigative journals focus more strongly on *why* it happened.

For feasibility reasons, one person served as primary coder for each case; identifying, reading, and coding literature required approximately 20 hours per case. Further, in past studies using similar coding methods, we had high inter-rater reliability (ICC=.84-1.0) (Authors, 2013a).

To ensure the trustworthiness of coding: (1) a PhD-level member of the team reviewed every case by reading 2 – 3 key articles on the case and examining the code sheet for completeness and accuracy; (2) we calculated the frequency with which different case researchers (n=3) used specific codes and either provided further training or refined our variable definitions when scores were widely discrepant (X^2 values that were significantly different, $p<.05$); and (3) we discussed all coding disagreements between the case researcher and the quality control reviewer during team meetings, with the principal investigator breaking ties when consensus was not achieved.

3. Analysis of Individual Cases using Forensic Theory—Phase 2 of our qualitative content analysis (Roller & Lavrakas, 2015) involved interpreting data. More specifically, we were interested in applying forensic theory to individual cases to understand which motives, means, and opportunities causally contributed to the occurrence of ICPS. Case researchers coded their theory of the case using a list of individual motives (e.g., financial gain or sex) and traits (e.g., substance addiction or suspected personality disorder), and a list of environmental factors (e.g., lack of oversight or vulnerable patients). Our code sheet operationally defined each of these terms. To make their reasoning process transparent to the quality control team, case researchers were also asked to write one or two paragraphs presenting their theory of the case, explaining how different factors provided motive, means, or opportunity for the IPCS.

4. Generating Explanatory Typologies—George and Bennett (2005) note that “there is a growing consensus that the strongest means of drawing inferences from case studies is the use of a combination of within-case analysis and cross-case comparison within a single study or research program...” (p. 18). Agreeing with this view, we asked the question: How do the theory-of-the-case variables meaningfully cluster together across cases to explain the occurrence of IPCS? In asking this question we assumed “equifinality”—that is, we assumed that different casual patterns led to IPCS. George and Bennett (2005) argue that when “a phenomenon is governed by equifinality, the investigator’s task is to produce a *differentiated* empirically based theory that identifies different causal patterns that produce similar outcomes” (p. 161). Hence, causal modeling using traditional statistical approaches such as regression analysis would yield a misleading picture, ignoring causal patterns that arise with relatively lower frequency (Bennett & Elman, 2006).

Accordingly, we developed explanatory typologies, which are “multidimensional conceptual classifications based on an explicitly stated theory”(Elman, 2005, p. 296). Our guiding

theory focused on the motive, means, and opportunities that explain the occurrence of the case.

Validating the Explanatory Typologies with Descriptive and Exploratory Statistics

We identified the most frequent theory-of-the-case factor found in each draft typology, which was always a trait (e.g., substance addiction) or motive (e.g., financial gain). This factor was used as a “sorting variable” to generate a column within a typology data table. We created rows using other trait/motive variables and environmental variables that were co-present with a sorting variable in more than one case. The frequencies primarily confirmed the typologies, but also refined and supplemented them by providing further, specific frequency data within typologies (i.e., regarding the prevalence of patient deaths within a typology).

To test the validity of the typologies, we included all of the cases that fit one of the typologies (n=93) and all the theory-of-the-case variables that were used in >1% of cases in a hierarchical cluster analysis (Namey, Guest, Thairu, & Johnson, 2008).

Findings

In what follows we present findings pertaining to (a) case attributes, (b) analysis of the theory of individual cases, (c) the qualitative development of our explanatory typologies, and (d) results from the descriptive and exploratory statistics we used to confirm our explanatory typologies.

Case Attributes

Table 1 presents the attributes of our 100 cases. In what follows, we highlight the most frequent attributes and present attributes that do not appear in Table 1 because they have more than 5 dichotomous options (e.g., U.S. states). Nearly all cases (98%) occurred in private practice, typically solo or small practices owned by the wrongdoer; thus we designated 97% of cases as involving a lack of oversight (rather than oversight failures) and noted that the wrongdoer was in a position of authority over peers (84%). Most cases occurred in a state that had a PDMP in place for >1 year prior to the investigation; in no cases did the PDMP play a role in identifying the IPCS. We did not designate such cases as oversight failures because most state PDMPs are tasked with focusing primarily on opioid-seeking patients and pharmacies dispensing opioids.

Ninety-three percent of cases involved prescribing opioids. Most cases involved patients who suffered from chronic pain or opioid addictions. Twenty-one cases involved at least one patient death. Most cases involved substandard care (such as not taking a patient history prior to prescribing, 81%); many involved other forms of wrongdoing such as fraud (e.g., billing for exams that were never conducted, 32%), and failure to appropriately supervise staff (18%).

All cases involved investigation by a state medical board; 88% also involve a criminal investigation. Most physicians lost their license (94%) for a time and discontinued practicing

medicine long-term (86%); 64% received criminal penalties such as prison, fines, or probation.

Nearly all physicians were over 40 years old (90%) and male (88%). Only 37% were board certified. The physician specialty varied widely: 25% pediatrics or family medicine; 22% internal medicine or geriatrics; 10% emergency medicine or surgery; 9% psychiatry or neurology; 4% anesthesiology; 3% gynecology or obstetrics; and 27% other specialties.

Cases occurred in 28 states with 5 states contributing more than 5 cases: Florida (22%), Pennsylvania (9%), California (8%), New York (8%), and West Virginia (6%).

Analysis of Individual Cases Using Forensic Theory

Table 2 presents findings from the analysis of individual cases. Five motives or traits played an explanatory role in > 5% of cases: Financial gain (76%), self-centered personality traits (56%), substance abuse (physician impairment) (17%), trading drugs for sex (8%), and poor problem-solving skills (7%). Three environmental variables played an explanatory role in >5% of cases: Lack of oversight (93%), vulnerable patients (65%), and corrupt moral climate (found when cases involved multiple accomplices who were not subordinates).

Explanatory Typologies

Following review of the entire set of 100 cases, we identified three explanatory typologies, which are more fully described in Table 3. These typologies can be understood as causal clusters—combinations of variables that provide motive, means or opportunity, which are sufficient to give rise to IPCS.

1. Motivated by financial gain, physicians with self-centered personality traits in small private practices with little oversight and opioid demand from vulnerable patients.
2. Physicians with SUDs themselves in small private practices with little oversight.
3. Physicians with poor skills or judgment in small private practices with little oversight.

Ninety-three percent of cases fit within one of the three typologies.

Confirmation of the Explanatory Typologies Using Descriptive and Exploratory Statistics

Table 4 presents the distribution of case attributes according to each of the three typologies.

We ran a hierarchical cluster analysis on cases to test whether cases would group in ways similar to the explanatory typologies developed through qualitative analysis. The four cases involving oversight failure—which were evenly split across financial gain and substance abuse typologies—performed erratically in cluster analysis creating a cluster with only two cases. When we removed these four cases, we had a 2-cluster solution for 89 cases ($X^2=62.36$, $p<.001$). The two clusters can be interpreted as representing financial gain cases ($n=74$) and “impaired judgment” cases ($n=15$). These clusters mapped onto the three typologies in the following manner: All financial gain cases clustered together—including the 7 substance abuse cases that involved financial gain as a cross-cutting variable; the

remaining 8 substance abuse cases clustered together with our 7 poor-problem solving cases, yielding a cluster of impaired judgment cases. All other variables—sex, lack of oversight, vulnerable victims, severe mental disorders—split as predicted in the typology table once cases were divided into two groups. This provided substantial validation of the qualitative typologies.

Discussion

We identified and reviewed an average of 17 documents for each of 100 cases of IPCS, identified the attributes of cases, analyzed each case using forensic theory, and validated 3 explanatory typologies of IPCS cases. Ours is the most in-depth study of IPCS cases since Goldenbaum et al.'s study of cases from 1998-2006. Our findings advance understanding of IPCS in several ways.

Consistent with other studies of physicians who were criminally prosecuted or investigated for IPCS, the physicians in our cases were predominantly male, older, non-board certified, and practicing general, family or internal medicine (Goldenbaum et al., 2008; Kohatsu, Gould, Ross, & Fox, 2004; Spickard et al., 2002). Among the more notable novel attributes our study tracked is practice setting: Nearly all were solo or small group practitioners—whereas nationally only one-third of physicians work in such settings (Center for Studying Health System Change, 2009). Our study is also the first to extrapolate information about physician personality traits: We found that 57% of cases—and 74% of those cases that were motivated by financial rewards—involved evidence of self-centered traits typical of antisocial or narcissistic personalities.

Our data are consistent with the 4D model used by the AMA insofar as we identified cases that involved physicians who were dishonest, disabled, duped, and dated. However, each of the 4D typologies focuses on one physician trait per typology to the exclusion of other factors that play an explanatory role. Some of these factors cut across the typologies—being male, older, lacking board certification, and practicing in private settings with little oversight. Other factors cluster tightly with just one typology (e.g., evidence of self-centered personality traits was found in financial gain cases but not in poor judgment cases). Further, when “duped” and “dated” rise to the level of disciplinary action—as in all of our cases—they do not look different from each other. They appear as physicians who are not practicing up to the standard of care. Only 1 of these 7 cases involved a board certified physician, whereas 90% of physicians are board certified (Center for Studying Health System Change, 2009).

Despite the fact that our cluster analysis generated a 2-typology model, we would resist reducing the 3 typologies to 2 because they offer more explanatory power: Treating substance abuse as its own typology helps to explain why 7 of the financial gain cases occurred (they needed money to support a drug habit), and why 8 of the cases involved poor decision-making (they were abusing opioids). Further, cases involving physicians with SUDs may also merit responses from medical boards that are distinct from cases due primarily to financial gain or poor judgment.

Based on their survey of state medical boards, which involved a comparison of those states with and without a PDMP, Hoffman and colleagues concluded that “it does not appear that electronic data tracking mechanisms led to increased numbers of complaints, investigations, or disciplinary actions against physicians related to opioid overprescribing practices” (Hoffman & Tarzian, 2003)^{p. 35}. Our study confirms this trend: Not one physician who was investigated in our study was flagged by a PDMP. Physicians have been criminally prosecuted when they appear to have had the best interest of patients in mind (Hoffman, 2008-2009). However, in our study—as well as the study by Goldenbaum and colleagues (Goldenbaum et al., 2008)—this happened rarely. Most cases of criminal prosecution were justified by standards widely shared in the literature insofar as the primary purpose of the prescription appeared to be profit-making or satisfying one's own SUD (Hoffman & Tarzian, 2003; Jung et al., 2006; Wesson & Smith, 1990).

Professional lapses are difficult to study given that an unknown percentage of cases are investigated and when investigated, inconsistent numbers and kinds of variables are reported. Our approach has the advantage of drawing upon diverse sources to form rich and meaningful pictures while drawing upon both individual and environmental factors. However, this came at the cost of working with a dataset that is large by qualitative standards, but small by quantitative standards. Further research is needed to determine if the clusters of variables we identified are generalizable to the broader population of IPCS cases. Moreover, given our dependence on court records and reports from boards and investigative journalists, we are confident when we say an attribute was present in a case; but its absence could be due to failure to report something that was present. Hence, our study may underestimate the frequency of some variables.

Recommendations

Many of the factors associated with IPCS cases that were identified in this study do not lend themselves to preventive interventions: While being older and male is a risk factor, most such physicians avoid sanctions, and targeting such physicians for heightened scrutiny seems inappropriate.

However, this study helps to justify efforts to promote board certification. It may also justify efforts to increase interaction with peers and trainees rather than focusing only on formal oversight mechanisms: only two cases occurred in academic medicine, where physicians are likely to be observed, and perhaps questioned, by peers, residents and medical students. While it may seem obvious to recommend that PDMPs should focus more attention on physician prescribing patterns, such a solution risks exacerbating the existing fears of physicians (described in the introduction) regarding the risk of adequately treating pain using opioids. An alternative, which takes into account the overwhelming number of cases occurring in small or solo private practices, is to explore means of increasing peer oversight, perhaps through collaborative practice agreements or other means that would increase peer oversight of practice.

Finally, given the apparent role of self-centered personality traits, medical schools, training programs, and medical boards may want to increase sensitivity to trainees who exhibit antisocial behaviors; a lack of remorse; and callous disregard for the wellbeing of others,

particularly in light of previous studies that found unprofessional behavior in medical school and residency predict subsequent disciplinary action as a physician (Papadakis, Arnold, Blank, Holmboe, & Lipner, 2008; Papadakis et al., 2005). Perhaps such individuals should be permitted to proceed to the next step of training or licensure with the understanding that they will initially practice medicine within the confines of a collaborative practice agreement.

Future research on criminal and board actions against physicians would benefit greatly from more uniform and detailed documentation and reporting on the diverse individual and environmental factors involved in cases.

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Table 1
Frequency of Case Attributes (N=100)

Setting		Wrongdoer Description	
Non-Academic, Private Practice	98%	Age > 40 years old	90%
State with PDMP for >1 year	65%	Sex of the Wrongdoer: Male	88%
Prescription Recipient		Born outside the US	16%
Patients	81%	Trained outside the US	32%
Vulnerable patients	73%	Self-centered personality traits	57%
Patients died as a result	21%	Evidence of severe mental illness	5%
Opioids were prescribed	93%	Board certified	37%
Social Dynamics		Unfit to stand trial / insanity plea	0%
Accomplice involved	46%	Substance addiction	18%
Conflicting roles	0%	Repeated main wrongdoing	98%
Others benefit/profit from misbehavior	53%	Wrongdoing in >1 environment	19%
Proper conduct penalized	0%	Illegal behavior unrelated to the case	12%
Others penalized for right conduct	2%	Significant personal problems	14%
Mistreatment of wrongdoer	0%	Poor professional skills / job difficulties	26%
Ambiguous norms	1%	Blamed on job pressure	1%
Oversight failure	9%	Financial gain from wrongdoing	81%
In authority over co-workers	85%	Ambition served by wrongdoing	0%
Financial conflict of interest	0%	Case involved sex	10%
Lack of oversight	97%	Consequences	
Corrupt moral climate	13%	Loss of licensure*	94%
Other notable environmental factor	3%	Financial penalties	53%
Investigation		Prison, criminal probation or service	64%
Board investigation	100%	Mandated treatment or education	24%
Criminal investigation	88%	Discontinued practicing medicine	86%
Civil proceedings	28%		
Others were found guilty	29%		

Note. Loss of licensure is not always permanent; hence, fewer physicians discontinued practicing medicine longer-term than lost their license.

Table 2
Rank-Ordered Theory-of-the-case Variable Frequencies

Traits or Motive Variables		Environmental or Opportunity Variables	
Financial gain	76%	Lack of oversight	93%
Self-centered personality traits	56%	Vulnerable victims	65%
Substance abuse	17%	Corrupt moral climate	11%
Sex	8%	Oversight failure	4%
Poor problem-solving	7%	Ambiguous norms	1%
Severe mental disorder	3%	Conflicting roles	0%
Carelessness	1%		
Stress or job pressure	1%		
Ambition	0%		
Retaliation	0%		

Table 3
Explanatory Typologies for Improper Prescribing of Controlled Substances

Typology 1. Financial Gain: Self-centered Thinking, a Lack of Oversight and Opioid Demand from Vulnerable Patients

The most common family of case scenarios revolves around financial gain or greed (69/100, 69%). The protagonists sold prescriptions for controlled substances to patients for cash, making a lot of money off of this arrangement. (Four percent also traded drugs for sex.) In 94% of these cases, there was a lack of oversight of the protagonists' practice of medicine. Typically, protagonists owned their own practice and operated without the oversight of peers, residents, or administrators. They usually operated in states with Prescription Drug Monitoring Plans, but in no case did a PDMP flag the improper prescribing. Often the protagonist had employees at their practice, but these individuals were subordinates and often accomplices in the scheme who also profited financially. Most protagonists were male (92%) with self-centered personality traits (74%), who demonstrated a reckless disregard for the safety and wellbeing of their patients, giving them addictive and dangerous drugs with little or no examination. Protagonists would continue to prescribe in a dangerous manner despite knowing that several patients had died of overdoses. Some engaged in illegal behavior unrelated to their prescribing (e.g., tax evasion, fraud or assault). The patients they saw were generally vulnerable (71%) insofar as they suffered from substance addictions or chronic pain, both of which can compromise decision-making capacity and voluntariness. These patients created the "market demand" for the drugs. (In rare cases, the "patients" receiving prescriptions were drug dealers who were sold drugs without being seen by the physician.)

Of these cases, 59% contained all four of the most salient theory-of-the-case factors: Financial gain, a lack of oversight, self-centered personality traits, and vulnerable patients. Twenty six percent of cases illustrating this typology involved patients dying from opioid prescribing.

Typology 2. Substance Abuse: Physicians with Addictions and Little Oversight

Seventeen percent of cases (17/100) involved protagonists who had a substance abuse disorder. They abused their opioid prescribing privileges to satisfy their addictions. The protagonist would write prescriptions for fake or dead patients and then impersonate them to get the drugs for themselves, or they would trade the prescription drugs for their drug of choice. These protagonists had a history of addiction usually stemming from significant personal problems or injuries. Similar to storyline 1, most also operated in private practice without the oversight of colleagues, residents, or medical students (76%) and they saw patients who were vulnerable due to their own addictions or chronic pain (53%). In some cases (41%), the protagonists also saw significant financial gain from their abuse of prescribing privileges, though in these cases we believe that the professional lapses were primarily attributable to their addiction rather than financial gain. Twelve percent of patients died in cases illustrating typology 2.

Typology 3. Poor Judgment or Skills with Little Oversight

A small minority of cases involved protagonists who appeared to want the best for their patients, but used poor judgment (7/100, 7%). They saw their patients in clinic before prescribing medications. Usually, these physicians improperly prescribed opioids to a small number of their patients, rather than relying on improper prescribing as a primary source of income. Again, most of these cases occurred in settings that provide little oversight (63%). These few cases were highly varied. Some involved physicians whose level of skill seemed low; others involved failing to recognize that a percentage of their patients were addicted to opioids; and some involved ambiguous standards for treating pain. No patients died within this typology.

Note. Seven cases (7%) did not fit in any of these three typologies.

Table 4
Confirmatory Frequency Analysis of the Three Typologies

	Financial gain	Substance abuse	Poor problem-solving/skills	Overall row frequency
Other Traits/Motives				
Self-centered personality	52 (75%)	0 (0%)	0 (0%)	52 (56%)
Sex	3 (4%)	3 (18%)	0 (0%)	6 (7%)
Severe mental illness	3 (4%)	0 (0%)	0 (0%)	3 (3%)
Interacting Trait				
Financial gain as interacting	n/a	7 (41%)	0 (0%)	7 (8%)
Environmental Factors				
Lack of oversight	65 (94%)	15 (88%)	7 (100%)	87 (93%)
Vulnerable victims	49 (71%)	9 (53%)	3 (43%)	61 (66%)
Corrupt climate	11 (16%)	0 (0%)	0 (0%)	11 (12%)
Oversight failure	2 (3%)	2 (12%)	0 (0%)	4 (4%)
Patient-related Factors				
Opioids prescribed	64 (93%)	17 (100%)	6 (86%)	87 (93%)
Patient died	15 (22%)	5 (29%)	1 (14%)	21 (23%)
Physician Attributes				
Male	63 (91%)	14 (82%)	5 (71%)	82 (88%)
Over 40	64 (93%)	14 (88%)	6 (86%)	84 (90%)
Board certified	24 (35%)	9 (53%)	2 (29%)	35 (38%)
n of cases	69	17	7	93

Notes. This table includes variables appearing in >1 Cases, N = 93.

(%) = Percentages in parentheses are percent of cases in column, not overall cases.

We present each case under 1 and only 1 column. Seven cases did not fit one of the 3 models above—e.g., the wrongdoing seemed due to carelessness, job pressures, or ambiguous norms.

Financial gain was added as an interacting theme to represent its role in cases designated as primarily due to substance abuse or poor professional skills. In case in which it appears as an interacting theme, the case does not appear under the financial gain column.