# Update on Prescription Drug Overdose Research

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# Methodology

- De-duplicated CSDB 1999-2004
- Linked CSDB to death certificate database and medical examiner data
- Identified populations of interest
  - All decedents – anyone with a CSDB record that died of any cause
  - Poisoning decedents – anyone with a CSDB record that died with primary cause X42, X44, Y12, Y14

# ICD-10 Codes Used to Identify Poisoning Decedents

| ICD-10 Code | Description |
|---|---|
| X42 | Accidental poisoning by and exposure to narcotics and psychodysleptics [hallucinogens], not elsewhere classified |
| X44 | Accidental poisoning by and exposure to other and unspecified drugs, medicaments and biological substances |
| Y12 | Poisoning by and exposure to narcotics and psychodysleptics [hallucinogens], not elsewhere classified, undetermined intent |
| Y14 | Poisoning by and exposure to other and unspecified drugs, medicaments and biological substances, undetermined intent |

# Research Questions

- What proportion of narcotics poisoning decedents had a valid controlled substance prescription at time of death?
- …within other time intervals of death?

# Results

- CSDB includes 22,215,483 records.
- Drug class H3A that includes the narcotic pain medications comprises 51.9% of the total number of prescriptions in the CSDB for the study years
- Able to separate drugs primarily indicated for cough suppression that include opioids using the NDC included with the CSDB record
- *Able to identify extended release preps*

# Results

- 734 poisoning decedents identified
- 47% (374) had an active narcotic Rx at time of death
  - 57% filled within 30 days of death,
  - 63% within 90 days of death, and 75% within 365 days of death.
- No evidence of a filled opioid prescription from 1999 through the date of death for only 15% (115) of these decedents

# Concordance

- Using drugs identified on toxicology (ME)
- Did they have an active prescription for every drug identified on toxicology as contributing to death?
- 43% YES
- Demographics did not differ by concordance status.
- We consider the reported concordance to be a lower bound.

# Specialty of Prescribers

- In partnership with UMA
- Used their database which includes provider specialty (self-report; not 100% complete)
  - Does not include DEA number
- Linked using last name, first name, middle initial and address (if needed) to the DEA number dataset from DOPL
  - Does not include specialty

# Limitations

- Lacking specialty for some providers
- CSDB includes records
  - With DEA number missing
  - Invalid DEA numbers
    - e.g. EXPIRED, 999999999, NEED THIS
- Self report specialty data
- * in process of comparing the distribution of specialties reported in UMA data to Utah workforce data

# Results

- Distribution of specialties in entire CSDB
- Distribution of specialties for narcotics prescriptions in entire CSDB
- Specialties of active narcotics prescriptions at time of death for all decedents
- Specialties of active narcotics prescriptions at time of death for narcotics poisoning decedents
- Relative contributions

# Specialty of Narcotic Prescribers – Entire CSDB

| SPECIALTY | Rank | Frequency | Percent |
|---|---|---|---|
| **FP/M** | **1** | 1813541 | 28.22 |
| **IM** | **2** | 893083 | 13.9 |
| **ORS** | **3** | 739237 | 11.5 |
| **EM** | **4** | 528548 | 8.22 |
| **OBG** | **5** | 342443 | 5.33 |
| **RET** | **6** | 259177 | 4.03 |
| **GS** | **7** | 205442 | 3.2 |
| **PMR** | **8** | 194030 | 3.02 |
| **AN** | **9** | 137008 | 2.13 |
| **U** | 10 | 134210 | 2.09 |

# Specialty of Prescribers – Active Narcotics Among All Deaths

| SPECIALTY | Rank | Frequency | Percent |
|---|---|---|---|
| FP/M | 1 | 5863 | 38.57 |
| IM | 2 | 4269 | 28.09 |
| PAL | 3 | 1084 | 7.13 |
| ONC | 4 | 628 | 4.13 |
| PMR | 5 | 349 | 2.3 |
| RET | 6 | 340 | 2.24 |
| ORS | 7 | 259 | 1.7 |
| HEM | 8 | 242 | 1.59 |
| EM | 9 | 233 | 1.53 |
| PUD | 10 | 167 | 1.1 |

# Specialty of Prescribers – Active Narcotics Among Poisoning Deaths

| SPECIALTY | Rank | Frequency | Percent |
|---|---|---|---|
| FP/M | 1 | 95 | 33.22 |
| IM | 2 | 52 | 18.18 |
| ORS | 3 | 23 | 8.04 |
| PMR | 4 | 23 | 8.04 |
| AN | 5 | 21 | 7.34 |
| EM | 6 | 10 | 3.5 |
| N | 6 | 10 | 3.5 |
| P | 7 | 7 | 2.45 |
| RET | 7 | 7 | 2.45 |
| RHU | 7 | 7 | 2.45 |

# Is it what we would expect?

- We’ve heard a lot about how the Rx drug overdose problem is driven by over- or casual prescribing by primary care providers (PCP)
- PCP write the most prescriptions but are not over-represented among the deaths
  - Contribute highest magnitude of deaths
  - In proportion with expectation based on prescribing

# Relative Contribution

| | Entire CSDB | | All Decedents | | Narcotic Poisoning Decedents | | Narcotic Poisoning Decedents: All Decedents |
|---|---|---|---|---|---|---|---|
| SPECIALTY | Rank | % | Rank | Count (%) | Rank | Count (%) | |
| Anesthesiology | 14 | 1.29 | 11 | 164 (1.08) | 5 | 21 ( 7.34) | 6.8 |
| Psychiatry | 3 | 6.95 | 21 | 61 (0.4) | 7 | 7 (2.45) | 6.1 |
| Rheumatology | 17 | 1.01 | 19 | 77 (0.51) | 7 | 7 (2.45) | 4.8 |
| Orthopedic Surgery | 4 | 6.2 | 7 | 259 (1.7) | 3 | 23 (8.04) | 4.7 |
| Neurology | 9 | 1.91 | 15 | 134( 0.88) | 6 | 10 (3.5) | 4.0 |
| Physical Medicine and Rehabilitation | 10 | 1.89 | 5 | 349 (2.3) | 4 | 23 (8.04) | 3.5 |
| General Practice | 16 | 1.05 | 17 | 103 (0.68) | 8 | 6 (2.1) | 3.1 |
| Urology | 12 | 1.34 | 18 | 98 (0.64) | 9 | 5 (1.75) | 2.7 |
| Emergency Medicine | 6 | 4.78 | 9 | 233 (1.53) | 6 | 10 (3.5) | 2.3 |
| Pediatrics | 7 | 4.76 | 16 | `134 (0.88) | 9 | 5 (1.75) | 2.0 |
| Retired | 8 | 4.12 | 6 | 340 (2.24) | 7 | 7 (2.45) | 1.1 |
| Family Medicine/Practice | 1 | 31.97 | 1 | 5863 (38.57) | 1 | 95 (33.22) | 0.9 |
| Internal Medicine | 2 | 16.74 | 2 | 4269 (28.09) | 2 | 52 (18.18) | 0.6 |

- Some specialties wrote a greater proportion of active narcotics at death than would be expected based on their prescribing for all decedents.
- Working on how to compare to entire CSDB with a valid measure

# Drug Categories

- Entire CSDB
- Some drug categories appear relatively more frequently among any cause decedents than in entire CSDB
  - e.g. morphine, fentanyl – used in end of life care
- Comparison of active narcotics prescriptions at time of death among narcotics poisoning decedents to all decedents

- Working on a way to quantify relative burden of narcotics among poisoning decedents to entire CSDB

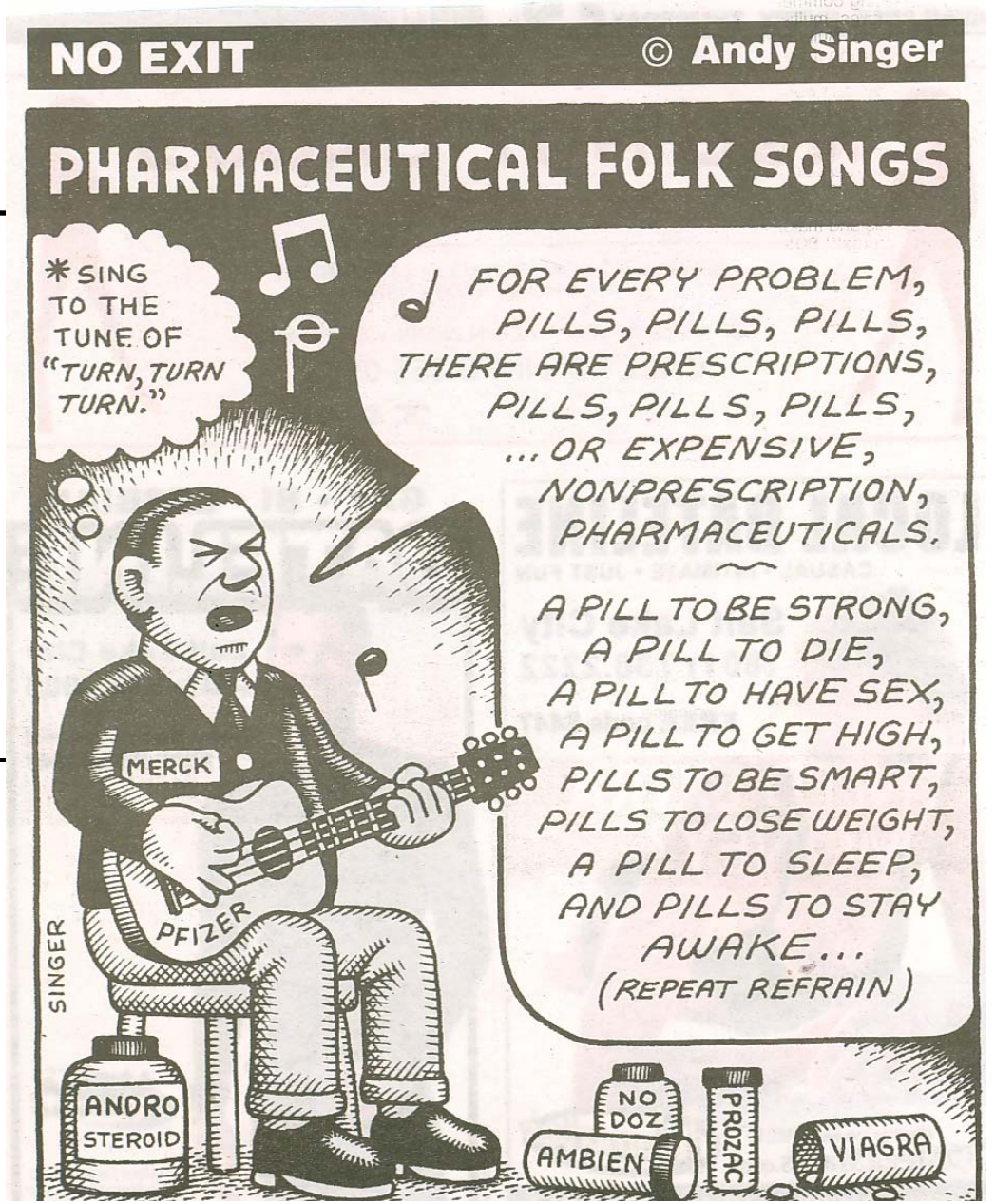
| Drug Category | Frequency | Percent |
|---|---|---|
| Hydrocodone (H3A) | 7164766 | 32.34 |
| Antianxiety Drugs (H2F) | 3080535 | 13.9 |
| Oxycodone (H3A) | 1911383 | 8.63 |
| Non-Barbiturate, Sedative Hypnotics (H2E) | 1750903 | 7.9 |
| Anti-Narcolepsy/Anti-Hyperkinesis Agents (H2V) | 878758 | 3.97 |
| Anorexic Agents (J8A) | 876655 | 3.96 |
| Propoxyphene (H3A) | 801492 | 3.62 |
| Anticonvulsants (H4B) | 783788 | 3.54 |
| Codeine (H3A) | 766360 | 3.46 |
| Narcotic Analgesic and Non-salicylate Analgesic Combination (H3U) | 671714 | 3.03 |
| Adrenergics, Aromatic, Non-Catecholamine (J5B) | 670218 | 3.03 |
| Narcotic Antitussives -1$^{st}$ Generation (B3Q) | 354240 | 1.6 |
| Narcotic Antitussive-Expectorants (B4S) | 311401 | 1.41 |
| Methadone (H3A) | 206412 | 0.93 |
| Antidiarrheals (D6D) | 183249 | 0.83 |
| Morphine (H3A) | 179843 | 0.81 |
| Fentanyl (H3A) | 171536 | 0.77 |
| Meperidine (H3A) | 157217 | 0.71 |
| Skeletal Muscle Relaxants (H6H) | 148571 | 0.67 |
| Barbiturates (H2D) | 145641 | 0.66 |
| Cough and Cold Preparation (B3K) | 129344 | 0.58 |

| | Entire CSDB N=11,495,797 | | Active Narcotics Rx at time of death (n = 21,390 prescriptions) | | Active Narcotics Rx at time of death among narcotics poisoning decedents (n=536 prescriptions) | | |
|---|---|---|---|---|---|---|---|
| | Count | % | Count | % | Count | % | Ratio to all decedents |
| METHADONE | 206,412 | 1.8 | 1,075 | 5.0 | 115 | 21.5 | 4.27 (3.59, 5.07) |
| MORPHINE | 179,843 | 1.6 | 6,436 | 30.1 | 38 | 7.1 | 0.24 (0.17, 0.32) |
| FENTANYL | 171,536 | 1.5 | 3,956 | 18.5 | 33 | 6.2 | 0.33 (0.24, 0.46) |
| OXYCODONE | 1,911,383 | 16.6 | 3,913 | 18.3 | 150 | 28.0 | 1.53 (1.33, 1.76) |
| AGONIST-ANTAGONIST | 75,883 | 0.7 | 15 | 0.1 | 2 | 0.4 | 5.32 (1.22, 23.21) |
| HYDROCODONE | 7,164,766 | 62.3 | 4,677 | 21.9 | 169 | 31.5 | 1.44 (1.27, 1.64) |
| MEPERIDINE | 157,217 | 1.4 | 131 | 0.6 | 3 | 0.6 | 0.91 (0.29, 2.86) |
| PROPOXYPHENE | 801,492 | 7.0 | 679 | 3.2 | 15 | 2.8 | 0.88 (0.53, 1.46) |
| CODEINE | 766,360 | 6.7 | 316 | 1.5 | 11 | 2.1 | 1.39 (0.77, 2.52) |

# Next Steps

- Examine relationship between changes in dose and risk of death
- Include the emergency department data –
  - History of non-fatal overdose may predict risk
- Examine prescription history among *illicit* drug overdose decedents
- Geographic description of poisoning and prescribing in Utah

# Questions…


NO EXIT
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PHARMACEUTICAL FOLK SONGS
*SING TO THE TUNE OF "TURN, TURN TURN."
FOR EVERY PROBLEM, PILLS, PILLS, PILLS, THERE ARE PRESCRIPTIONS, PILLS, PILLS, PILLS, ...OR EXPENSIVE, NONPRESCRIPTION, PHARMACEUTICALS.
A PILL TO BE STRONG, A PILL TO DIE, A PILL TO HAVE SEX, A PILL TO GET HIGH, PILLS TO BE SMART, PILLS TO LOSE WEIGHT, A PILL TO SLEEP, AND PILLS TO STAY AWAKE... (REPEAT REFRAIN)
MERCK
PFIZER
SINGER
ANDRO STEROID
NO DOZ
AMBIEN
PROZAC
VIAGRA