Overview of the Opioid NDC and MME Analytical File Compiled by CDC

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Agenda

- What is the “Opioid NDC and MME Analytical File”
- Purpose & Development of the file
- Applications of the file
- Important Distinction

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What is the Opioid NDC and MME Analytical File

+ **CDC-compiled file that contains:**
  - Current and active FDA-approved opioid medications
  - Deactivated opioid medications, e.g., propoxyphene
  - File is organized and sorted by NDC numbers of opioids
  - Drug name, strength of the opioid ingredient, DEA schedule of the drug
  - Linked oral MME conversion factor
+ **NDC**
  - National Drug Code
+ **MME**
  - Morphine Milligram Equivalent
+ **File has been available since 2014 and updated annually**

Screen shot of the Opioid NDC and MME Analytical File

A	B	C	D	E	F	G	H	I
NDC	PRODNME	GENNME	Master_Form	LongShortActing	DEAClassCode	Strength_Per_Unit	UOM	MME_Conversion_Factor
00304140701	HYDROCODONE W/APAP	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	5	MG	1
00304140705	HYDROCODONE W/APAP	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	5	MG	1
00339404912	HYDROCODONE BITARTRATE-ACETAMINOPHEN	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	5	MG	1
00339405112	HYDROCODONE BITARTRATE-ACETAMINOPHEN	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	7.5	MG	1
00349849401	HYDROCODONE BITARTRATE-ACETAMINOPHEN	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	5	MG	1
00349849405	HYDROCODONE BITARTRATE-ACETAMINOPHEN	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	5	MG	1
00349849410	HYDROCODONE BITARTRATE-ACETAMINOPHEN	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	5	MG	1
00349849453	HYDROCODONE BITARTRATE-ACETAMINOPHEN	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	5	MG	1
00364074401	HYDROCODONE BITARTRATE-ACETAMINOPHEN	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	5	MG	1
00364074405	HYDROCODONE BITARTRATE-ACETAMINOPHEN	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	5	MG	1
00364250501	HYDROCODONE BITARTRATE-ACETAMINOPHEN	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	7.5	MG	1
00403109710	LORCET PLUS	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	7.5	MG	1
00403109715	LORCET PLUS	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	7.5	MG	1
00403109720	LORCET PLUS	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	7.5	MG	1
00403125810	HYDROCODONE BITARTRATE-ACETAMINOPHEN	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	5	MG	1
00403125812	HYDROCODONE BITARTRATE-ACETAMINOPHEN	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	5	MG	1
00403125814	HYDROCODONE BITARTRATE-ACETAMINOPHEN	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	5	MG	1
00403125815	HYDROCODONE BITARTRATE-ACETAMINOPHEN	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	5	MG	1
00403125820	HYDROCODONE BITARTRATE-ACETAMINOPHEN	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	5	MG	1
00403125824	HYDROCODONE BITARTRATE-ACETAMINOPHEN	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	5	MG	1
00403126012	HYDROCODONE BITARTRATE-ACETAMINOPHEN	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	7.5	MG	1
00403126015	HYDROCODONE BITARTRATE-ACETAMINOPHEN	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	7.5	MG	1
00403126020	HYDROCODONE BITARTRATE-ACETAMINOPHEN	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	7.5	MG	1
00403126030	HYDROCODONE BITARTRATE-ACETAMINOPHEN	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	7.5	MG	1
00403227710	VICODIN	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	5	MG	1
00403227712	VICODIN	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	5	MG	1
00403227715	VICODIN	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	5	MG	1
00403227730	VICODIN	Acetaminophen/hydrocodone Bitartrate	Tablet	SA	2	5	MG	1

Features of the file

- Comprehensive list of opioid NDCs
  - ÷ Currently 15k+ NDCs, both active and historical
- Essential information of the drug, e.g., *product name, generic name, strength, master form*
- Separate strength of opioid ingredient
  - ÷ Normally: HYDROCODONE BITARTRATE-ACETAMINOPHEN, 5mg/325mg
  - ÷ In CDC file: HYDROCODONE BITARTRATE-ACETAMINOPHEN, 5mg
- Oral MME conversion factor linked to each NDC
  - ÷ Strength/dosage of different opioid medications can be converted to morphine milligram equivalent
- Accompanied documentation covering details on the purpose of the file, exclusion criteria, instructions for use, caveats, etc.

Data Sources for the File

- **RED BOOK® by IBM**

÷ Provides detailed descriptions for over 300,000 prescription and over-the counter pharmaceuticals. Virtually, every drug product approved by the FDA for manufacture and distribution appears as a record in the RED BOOK database.

÷ RED BOOK uses NDC as unique identifier for each drug record

÷ Source of NDC: FDA publishes NDC numbers in the NDC Directory which is updated daily

÷ CDC receives RED BOOK annually

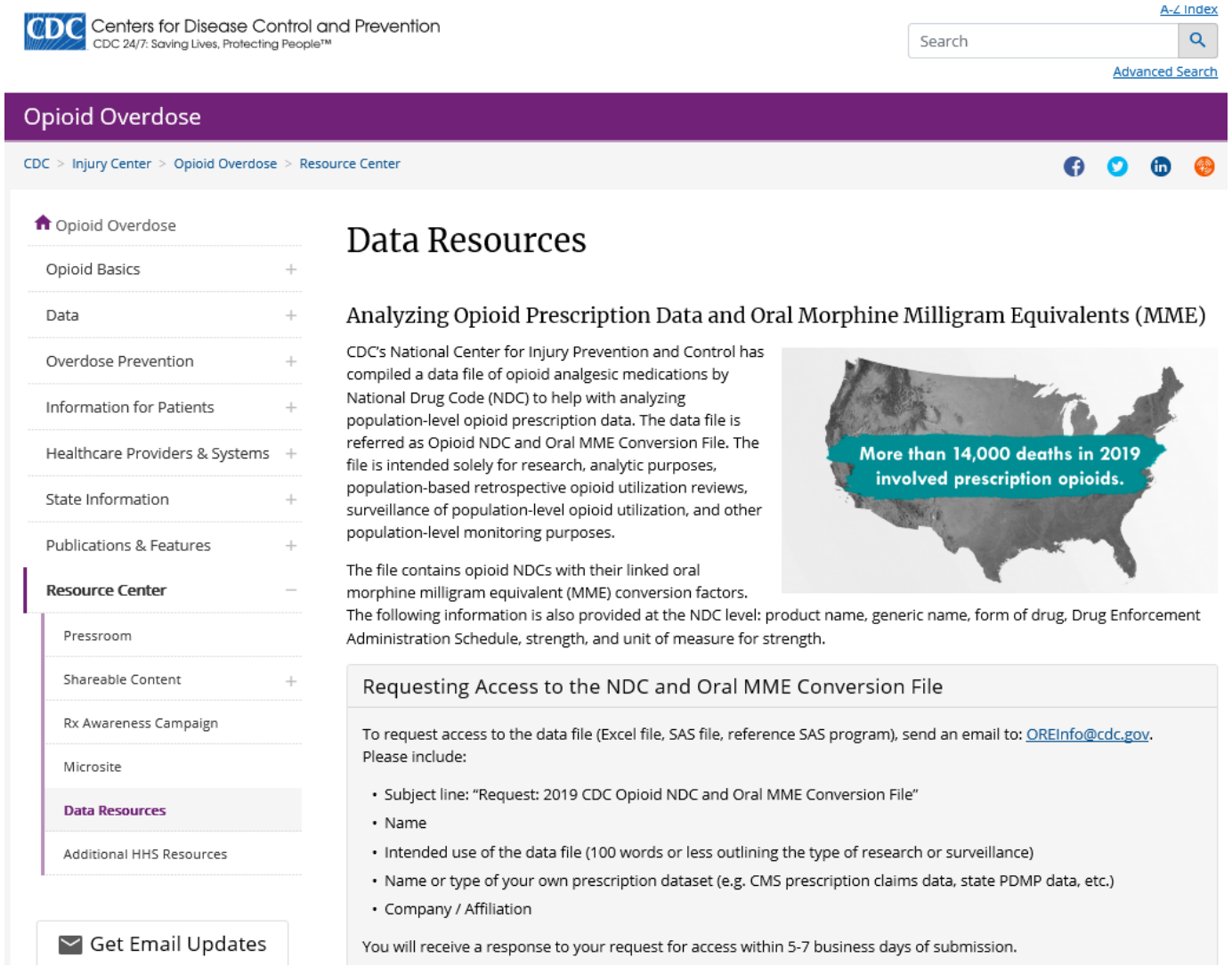
- **References for MME conversion factors, e.g.**

÷ Von Korff M, Saunders K, Ray GT, et al. De Facto Long-term Opioid Therapy for Noncancer Pain. The Clinical Journal of Pain 2008; 24: 521–527.

÷ Nielsen S, Degenhardt L, Hoban B, Gisev N. A Synthesis of Oral Morphine Equivalents (OMS) for Opioid Utilisation Studies. Pharmacoepidemiology and Drug Safety 2016; 25: 733–737.

÷ McPherson ML. Demystifying Opioid Conversion Calculations: A Guide for Effective Dosing. American Society of Health-System Pharmacists, 2nd Edition.

How to Request the Opioid NDC and MME Analytical File



https://www.cdc.gov/drugoverdose/resources/data.html

Agenda

+ What is the “Opioid NDC and MME Analytical File”
+ **Purpose & Development of the file**
+ Applications of the file
+ Important Distinction

Purpose of the File

+ **Identify the need**
  - More research on opioids started using pharmaceutical claims and pharmacy transaction data (e.g. PDMP)
  - Need one: Identify opioid prescriptions from these data
  - Need two: Calculate dosage of dispensed opioid prescriptions by converting the dosage to MME
+ **The opioid NDC and MME analytical file is intended as a data resource for:**
  - Research, analytical purposes using claims or dispensing data
  - Surveillance of population-level medication utilization
+ **The file is NOT intended for any clinical decision-making by clinicians while prescribing opioids**
  - The oral MME conversion factors in this file DO NOT constitute any clinical guidance for prescribing or recommendations for converting patients from one form of opioid analgesic to another

Development of the file

- More research on opioid started using pharmaceutical claims and pharmacy transaction data (e.g., PDMP)

  by academic researchers, federal agencies, payers, states, etc.

- However, dispensed medications in most of these data are recorded using NDC

Snapshot of a typical prescription claims dataset

ndcnum	svcdate	daysupp	metqty	copay	coins	deduct	age	sex
43386035701	03 Oct 19	5	20	0	0	3.24	42	2
65862067899	18 Oct 19	30	30	0	0	.7999997	42	2
68180098103	22 Dec 19	90	90	2.469999	0	0	42	2
16571020150	19 Sep 19	30	60	0	0	8.329994	38	2
60505265305	24 Oct 19	30	30	1.669999	0	0	42	2
13107005999	22 Oct 19	4	12	0	0	1.7	37	1
68180035205	21 Jan 19	90	90	12.99	0	0	38	2
68180035205	17 Apr 19	90	90	12.99	0	0	38	2
68180035205	02 Jul 19	90	90	12.99	0	0	38	2
68180035205	24 Sep 19	90	90	12.99	0	0	38	2
68180035309	25 Jan 19	90	90	8.57	0	0	44	2
16729013616	28 Jan 19	30	30	0	0	1.12	44	2
00591321901	25 Feb 19	10	60	0	0	46.54999	44	2
65162062711	25 Feb 19	7	28	0	0	1.169999	44	2

Development of the file – cont.

- Need one: identify opioids from dispensed prescription data (claims, pharmacy transactions, etc.)
- Need two: calculate dosage of the opioid prescription by converting the dosage to MME
- However, there was a lack of national resource to meet the needs

Which are opioids ?

ndcnum	svcdate	daysupp	metqty	copay	coins	deduct	age	sex
43386035701	03 Oct 19	5	20	0	0	3.24	42	2
65862067899	18 Oct 19	30	30	0	0	.7999997	42	2
68180098103	22 Dec 19	90	90	2.469999	0	0	42	2
16571020150	19 Sep 19	30	60	0	0	8.329994	38	2
60505265305	24 Oct 19	30	30	1.669999	0	0	42	2
13107005999	22 Oct 19	4	12	0	0	1.7	37	1
68180035205	21 Jan 19	90	90	12.99	0	0	38	2
68180035205	17 Apr 19	90	90	12.99	0	0	38	2
68180035205	02 Jul 19	90	90	12.99	0	0	38	2
68180035205	24 Sep 19	90	90	12.99	0	0	38	2
68180035309	25 Jan 19	90	90	8.57	0	0	44	2
16729013616	28 Jan 19	30	30	0	0	1.12	44	2
00591321901	25 Feb 19	10	60	0	0	46.54999	44	2
65162062711	25 Feb 19	7	28	0	0	1.169999	44	2

The first prescription is an opioid.

But what is the strength? 5mg or 10 mg?

Based on the type of opioid, what is the conversion factor?

Development of the file – cont.

+ **Find a data source that contains all opioid NDCs and is constantly updated**
  - RED BOOK data have been delivered to CDC annually as part of IBM MarketScan claims data delivery
    ÷ Virtually, every drug product approved by the FDA for manufacture and distribution appears as a record in the RED BOOK database
    ÷ RED BOOK uses NDC as drug identifier
    ÷ In addition to NDC, RED BOOK has other information we need for a drug, e.g., drug names, strength, etc.
    ÷ Updated frequently, although we receive updated file annually
+ **Find data sources for MME conversion factors**
  - Literature search and review for MME conversion factors

How we identify opioids in RED BOOK

- RED BOOK contains 300k+ NDCs, not only opioids
- Using therapeutic class codes in RED BOOK

Opioid analgesics: 60, 61, 62; opioid analgesics have the greatest number of NDCs, 15k+

ndcnum	thercls	gennme	prodnme	deaclas	strngth
35356039190	60	Oxymorphone Hydrochloride	OPANA ER	2	40 MG
35356039230	77	Pramipexole Dihydrochloride	MIRAPEX	6	0.125 MG
35356039330	68	Levetiracetam	KEPPRA	6	1000 MG
35356039512	59	Naproxen Sodium/Sumatriptan Succinate	TREXIMET	6	500 MG-85 MG
35356039630	58	Aspirin	ECOTRIN	7	325 MG
35356039860	77	Pregabalin	LYRICA	5	300 MG
35356039890	77	Pregabalin	LYRICA	5	300 MG
35356039930	60	Oxycodone Hydrochloride	OXYCONTIN	2	40 MG
35356040090	60	Oxycodone Hydrochloride	OXYCONTIN	2	80 MG
35356040130	68	Topiramate	TOPAMAX	6	200 MG
35356040260	60	Acetaminophen/Hydrocodone Bitartrate	VICODIN HP	2	660 MG-10 MG
35356040330	60	Oxymorphone Hydrochloride	OPANA ER	2	30 MG
35356040360	60	Oxymorphone Hydrochloride	OPANA ER	2	30 MG
35356040525	146	Bimatoprost	LUMIGAN	6	0.03%
35356040630	46	Hydrochlorothiazide/Irbesartan	AVALIDE	6	12.5 MG-300 MG
35356040730	46	Hydrochlorothiazide/Irbesartan	AVALIDE	6	25 MG-300 MG

Additional Processes

- Exclusion criteria
  - ÷ Opioids that are typically used in non-outpatient settings, e.g., alfentanil, sufentanil
  - ÷ Opioids of cough and cold formulations
  - ÷ Other injectable and IV opioids (not commonly dispensed by outpatient pharmacy, have different conversion factors)
- Identify and separate out strength for opioid ingredient

ndcnum	thercls	gennme	prodnme	deaclas	strngth
21695027072	60	Acetaminophen/Hydrocodone Bitartrate	HYDROCODONE BITARTRATE-ACETAMINOPHEN	2	500 MG-7.5 MG
10544038084	60	Oxycodone Hydrochloride	OXYCODONE HCL	2	10 MG
52959052190	60	Acetaminophen/Hydrocodone Bitartrate	HYDROCODONE BITARTRATE-ACETAMINOPHEN	2	500 MG-10 MG
60346010624	60	Acetaminophen/Hydrocodone Bitartrate	HYDROCODONE BITARTRATE-ACETAMINOPHEN	2	750 MG-7.5 MG
60346010620	60	Acetaminophen/Hydrocodone Bitartrate	HYDROCODONE BITARTRATE-ACETAMINOPHEN	2	750 MG-7.5 MG
60346010612	60	Acetaminophen/Hydrocodone Bitartrate	HYDROCODONE BITARTRATE-ACETAMINOPHEN	2	750 MG-7.5 MG
63629400901	60	Acetaminophen/Codeine Phosphate	ACETAMINOPHEN-CODEINE PHOSPHATE	5	120 MG/5 ML-12 MG/5 ML
16590091472	60	Oxycodone Hydrochloride	OXYCODONE HCL	2	20 MG
52959052112	60	Acetaminophen/Hydrocodone Bitartrate	HYDROCODONE BITARTRATE-ACETAMINOPHEN	2	500 MG-10 MG
00555038102	60	Meperidine Hydrochloride	MEPERIDINE HCL	2	50 MG

Additional processes – cont.

- Identify and separate out the name of the opioid ingredient

  ÷ hydrocodone, oxycodone, codeine, oxymorphone, methadone, etc.

- Assign MME conversion factors to each NDC based on the name of the opioid ingredient

  For example:

Opioid (strength in mg except where noted)	Oral MME Conversion Factor
Codeine	0.15
Dihydrocodeine	0.25
Hydrocodone	1
Hydromorphone	4
Meperidine	0.1
Morphine	1
Opium	1
Oxycodone	1.5
Oxymorphone	3

Additional processes – cont.

- Special considerations: fentanyl and methadone
  - ÷ Fentanyl: different types of preparations (e.g., Patch, Film, Lozenge)

ndc	prodnme	gennme	master_form	strength_p~t	uom
71335055603	FENTANYL TRANSDERMAL SYSTEM	Fentanyl	Patch, Extended Release	50	MCG/HR
71335060401	FENTANYL TRANSDERMAL SYSTEM	Fentanyl	Patch, Extended Release	100	MCG/HR
71335060402	FENTANYL TRANSDERMAL SYSTEM	Fentanyl	Patch, Extended Release	100	MCG/HR
71335060403	FENTANYL TRANSDERMAL SYSTEM	Fentanyl	Patch, Extended Release	100	MCG/HR
00037512030	ONSOLIS	Fentanyl Citrate	Film	1200	MCG
00037520030	ONSOLIS	Fentanyl Citrate	Film	200	MCG
00037540030	ONSOLIS	Fentanyl Citrate	Film	400	MCG
00037560030	ONSOLIS	Fentanyl Citrate	Film	600	MCG
00037580030	ONSOLIS	Fentanyl Citrate	Film	800	MCG
00074244305	FENTANYL ORALET	Fentanyl Citrate	Lozenge/Troche	100	MCG
00074244405	FENTANYL ORALET	Fentanyl Citrate	Lozenge/Troche	200	MCG
00074244505	FENTANYL ORALET	Fentanyl Citrate	Lozenge/Troche	300	MCG
00074244605	FENTANYL ORALET	Fentanyl Citrate	Lozenge/Troche	400	MCG

patch → 1 MCG =0.1 MG morphine; however, 24 hours a day, so 0.1x24=2.4

Film → 1 MCG =0.18 MG morphine

Lozenge → 1 MCG =0.13 MG morphine

  - ÷ Methadone: for the purpose of the MME analytical file, a conversion factor of 3 has been applied

Von Korff M, Saunders K, Ray GT, et al. De Facto Long-term Opioid Therapy for Noncancer Pain. The Clinical Journal of Pain 2008;24.

Final Opioid NDC and MME Analytical File

ndc	prodnme	gennme	master_form	strength_p~t	uom	mme_conver~r	deaclasscode
16590061462	OXYCODONE HCL-ACETAMINOPHEN	Acetaminophen/oxycodone Hydrochloride	Tablet	5	MG	1.5	2
16590061471	OXYCODONE HCL-ACETAMINOPHEN	Acetaminophen/oxycodone Hydrochloride	Tablet	5	MG	1.5	2
16590061472	OXYCODONE HCL-ACETAMINOPHEN	Acetaminophen/oxycodone Hydrochloride	Tablet	5	MG	1.5	2
16590061475	OXYCODONE HCL-ACETAMINOPHEN	Acetaminophen/oxycodone Hydrochloride	Tablet	5	MG	1.5	2
16590061482	OXYCODONE HCL-ACETAMINOPHEN	Acetaminophen/oxycodone Hydrochloride	Tablet	5	MG	1.5	2
16590061490	OXYCODONE HCL-ACETAMINOPHEN	Acetaminophen/oxycodone Hydrochloride	Tablet	5	MG	1.5	2
16590061830	PERCOCET	Acetaminophen/oxycodone Hydrochloride	Tablet	10	MG	1.5	2
16590061856	PERCOCET	Acetaminophen/oxycodone Hydrochloride	Tablet	10	MG	1.5	2
16590061860	PERCOCET	Acetaminophen/oxycodone Hydrochloride	Tablet	10	MG	1.5	2
16590061862	PERCOCET	Acetaminophen/oxycodone Hydrochloride	Tablet	10	MG	1.5	2
16590061872	PERCOCET	Acetaminophen/oxycodone Hydrochloride	Tablet	10	MG	1.5	2
16590061873	PERCOCET	Acetaminophen/oxycodone Hydrochloride	Tablet	10	MG	1.5	2
16590061882	PERCOCET	Acetaminophen/oxycodone Hydrochloride	Tablet	10	MG	1.5	2

- **File format: Excel file, SAS data file, SAS program**

Maintaining the analytical file

+ Annual update

- After we receive updated RED BOOK data every year, we:
  - ÷ Identify new opioid NDCs
  - ÷ Create an MME analytical file of these new NDCs
  - ÷ Combine this MME analytical file of new opioid NDCs to the previous year's file

Agenda

- What is the “Opioid NDC and MME Analytical File”
- Purpose & Development of the file
- **Applications of the file**
- Important Distinction

How to use the file?

- Remember this is a snapshot of typical claims dataset
- Pharmacy transaction data or dispensing data have similar layout

ndc	svcdate	daysupp	metqty	copay	coins	deduct
13668033101	11 Jun 19	30	30	10	0	0
00406012501	11 Jun 19	30	120	6.049999	0	0
00378001805	11 Jun 19	90	90	.8399997	0	0
62037083101	11 Jun 19	30	30	0	0	17.59
50458057930	11 Jun 19	30	30	5	0	0
68180072103	11 Jun 19	30	30	1.5	0	0
60631004030	11 Jun 19	30	30	0	37.32999	0
64380080807	11 Jun 19	10	30	0	3.33	0
00406052301	11 Jun 19	30	240	10	0	0
71093012105	11 Jun 19	30	180	5	0	0
13668013601	11 Jun 19	30	30	6.399998	0	0
53746010901	11 Jun 19	5	20	0	0	2.259998
69097083512	11 Jun 19	30	30	0	2.639999	0
69097084805	11 Jun 19	30	30	0	.8799996	0
68180051703	11 Jun 19	30	30	2.379999	0	0
57664037718	11 Jun 19	30	60	0	2.869999	0
54092038701	11 Jun 19	30	30	10	0	0

Join/merge claims data with MME analytical file

ndc	svcdate	daysupp	metqty	copay	coins	deduct
13668033101	11 Jun 19	30	30	10	0	0
00406012501	11 Jun 19	30	120	6.049999	0	0
00378001805	11 Jun 19	90	90	.8399997	0	0
62037083101	11 Jun 19	30	30	0	0	17.59
50458057930	11 Jun 19	30	30	5	0	0
68180072103	11 Jun 19	30	30	1.5	0	0
60631004030	11 Jun 19	30	30	0	37.32999	0
64380080807	11 Jun 19	10	30	0	3.33	0
00406052301	11 Jun 19	30	240	10	0	0
71093012105	11 Jun 19	30	180	5	0	0
13668013601	11 Jun 19	30	30	6.399998	0	0
53746010901	11 Jun 19	5	20	0	0	2.259998
69097083512	11 Jun 19	30	30	0	2.639999	0
69097084805	11 Jun 19	30	30	0	.8799996	0
68180051703	11 Jun 19	30	30	2.379999	0	0
57664037718	11 Jun 19	30	60	0	2.869999	0
54092038701	11 Jun 19	30	30	10	0	0

join/merge

NDC as key

The Opioid NDC and MME analytical File

After join/merge

From MME analytical file

ndc	svcdate	daysupp	metqty	copay	coins	deduct	gennme	strength_p~t	uom	mme_conver~r
13668033101	11 Jun 19	30	30	10	0	0		.		.
00406012501	11 Jun 19	30	120	6.049999	0	0	Acetaminophen/hydrocodone Bitartrate	10	MG	1
00378001805	11 Jun 19	90	90	.8399997	0	0		.		.
62037083101	11 Jun 19	30	30	0	0	17.59		.		.
50458057930	11 Jun 19	30	30	5	0	0		.		.
68180072103	11 Jun 19	30	30	1.5	0	0		.		.
60631004030	11 Jun 19	30	30	0	37.32999	0		.		.
64380080807	11 Jun 19	10	30	0	3.33	0		.		.
00406052301	11 Jun 19	30	240	10	0	0	Acetaminophen/oxycodone Hydrochloride	10	MG	1.5
71093012105	11 Jun 19	30	180	5	0	0		.		.
13668013601	11 Jun 19	30	30	6.399998	0	0		.		.
53746010901	11 Jun 19	5	20	0	0	2.259998	Acetaminophen/hydrocodone Bitartrate	5	MG	1
69097083512	11 Jun 19	30	30	0	2.639999	0		.		.
69097084805	11 Jun 19	30	30	0	.8799996	0		.		.
68180051703	11 Jun 19	30	30	2.379999	0	0		.		.
57664037718	11 Jun 19	30	60	0	2.869999	0	Tramadol Hydrochloride	50	MG	.1
54092038701	11 Jun 19	30	30	10	0	0		.		.

Calculation of MME daily dosage in these types of data

Formula for calculating daily MME: MME/day = Strength per Unit of Drug X (Number of Units/ Days Supply) X MME conversion factor

ndc	svcdate	daysupp	metqty	copay	coins	deduct	gennme	strength_p~t	uom	mme_conver~r	daily_dose
13668033101	11 Jun 19	30	30	10	0	0		.		.	.
00406012501	11 Jun 19	30	120	6.049999	0	0	Acetaminophen/hydrocodone Bitartrate	10	MG	1	40
00378001805	11 Jun 19	90	90	.8399997	0	0		.		.	.
62037083101	11 Jun 19	30	30	0	0	17.59		.		.	.
50458057930	11 Jun 19	30	30	5	0	0		.		.	.
68180072103	11 Jun 19	30	30	1.5	0	0		.		.	.
60631004030	11 Jun 19	30	30	0	37.32999	0		.		.	.
64380080807	11 Jun 19	10	30	0	3.33	0		.		.	.
00406052301	11 Jun 19	30	240	10	0	0	Acetaminophen/oxycodone Hydrochloride	10	MG	1.5	120
71093012105	11 Jun 19	30	180	5	0	0		.		.	.
13668013601	11 Jun 19	30	30	6.399998	0	0		.		.	.
53746010901	11 Jun 19	5	20	0	0	2.259998	Acetaminophen/hydrocodone Bitartrate	5	MG	1	20
69097083512	11 Jun 19	30	30	0	2.639999	0		.		.	.
69097084805	11 Jun 19	30	30	0	.8799996	0		.		.	.
68180051703	11 Jun 19	30	30	2.379999	0	0		.		.	.
57664037718	11 Jun 19	30	60	0	2.869999	0	Tramadol Hydrochloride	50	MG	.1	10
54092038701	11 Jun 19	30	30	10	0	0		.		.	.

Calculation of MME daily dosage for fentanyl transdermal patches

- How to use the formula directly to calculate daily dosage for a fentanyl patch
  - ÷ One patch of 25 MCG/HR releases how much MME in a day? 25 mcg x 0.1 x 24 hours = 60 MME (daily dose)
  - ÷ One patch is usually applied to the skin once every 72 hours, so to calculate daily dosage of the whole prescription:

    (25 mcg x 0.1 x 72 x 10) / 30 = 60 MME
  - ÷ If we want to apply the formular directly, what we do?

    (25 mcg x 0.1 x 72 x 10) / 30 = 60 MME

ndc	svcdate	daysupp	metqty	copay	coins	deduct	gennme	strength_p~t	uom	master_form
00378912198	12 Jul 19	30	10	0	0	0	Fentanyl	25	MCG/HR	Patch, Extended Release
00378912398	02 Feb 19	15	5	0	0	53.90997	Fentanyl	75	MCG/HR	Patch, Extended Release
00378912198	10 Jul 19	30	10	6.239998	0	0	Fentanyl	25	MCG/HR	Patch, Extended Release
00378911998	14 Feb 19	30	10	10	0	0	Fentanyl	12	MCG/HR	Patch, Extended Release
00378912298	05 Jul 19	30	10	5	0	0	Fentanyl	50	MCG/HR	Patch, Extended Release
00378912298	29 Jul 19	30	10	0	8.509995	0	Fentanyl	50	MCG/HR	Patch, Extended Release
00378912198	10 Sep 19	30	10	10	0	0	Fentanyl	25	MCG/HR	Patch, Extended Release
00378912198	07 Apr 19	30	10	15	0	0	Fentanyl	25	MCG/HR	Patch, Extended Release

Calculation of MME daily dosage for fentanyl transdermal patches – cont.

How to use the formular directly to calculate daily dosage for a fentanyl patch

- One patch of 25 MCG/HR releases how much MME in a day? 25 mcg x 0.1 x 24 hours = 60 MME (daily dose)
- One patch is usually applied to the skin once every 72 hours, so to calculate daily dosage of the whole prescription:

  (25 mcg x 0.1 x 72 x 10) / 30 = 60 MME

- If we want to apply the formular directly, what we do?

  (25 mcg x 0.1 x 72 x 10) / 30 = 60 MME

ndc	svcdate	daysupp	metqty	copay	coins	deduct	gennme	strength_p~t	uom	master_form	mme_conver~r	daily_dose
00378912198	12 Jul 19	30	10	0	0	0	Fentanyl	25	MCG/HR	Patch, Extended Release	7.2	60
00378912398	02 Feb 19	15	5	0	0	53.90997	Fentanyl	75	MCG/HR	Patch, Extended Release	7.2	180
00378912198	10 Jul 19	30	10	6.239998	0	0	Fentanyl	25	MCG/HR	Patch, Extended Release	7.2	60
00378911998	14 Feb 19	30	10	10	0	0	Fentanyl	12	MCG/HR	Patch, Extended Release	7.2	28.8
00378912298	05 Jul 19	30	10	5	0	0	Fentanyl	50	MCG/HR	Patch, Extended Release	7.2	120
00378912298	29 Jul 19	30	10	0	8.509995	0	Fentanyl	50	MCG/HR	Patch, Extended Release	7.2	120
00378912198	10 Sep 19	30	10	10	0	0	Fentanyl	25	MCG/HR	Patch, Extended Release	7.2	60
00378912198	07 Apr 19	30	10	15	0	0	Fentanyl	25	MCG/HR	Patch, Extended Release	7.2	60

Calculation of MME daily dosage for methadone

+ **Methadone: for the purpose of the MME analytical file, a conversion factor of 3 has been applied**
+ **Formula: MME/day = Strength per Unit of Drug X (Number of Units/ Days Supply) X MME conversion factor**

+ **Methadone prescriptions in real data: IQVIA national level dispensing data, 2019**
  - Methadone prescriptions accounted for about 1% (~1.45 million) of total opioid prescriptions excluding buprenorphine for opioid use disorder
  - Distribution of strength per unit among methadone prescriptions:

1 mg	0.44%
2 mg	0.18%
5 mg	23.8%
10 mg	75.6%
	100%

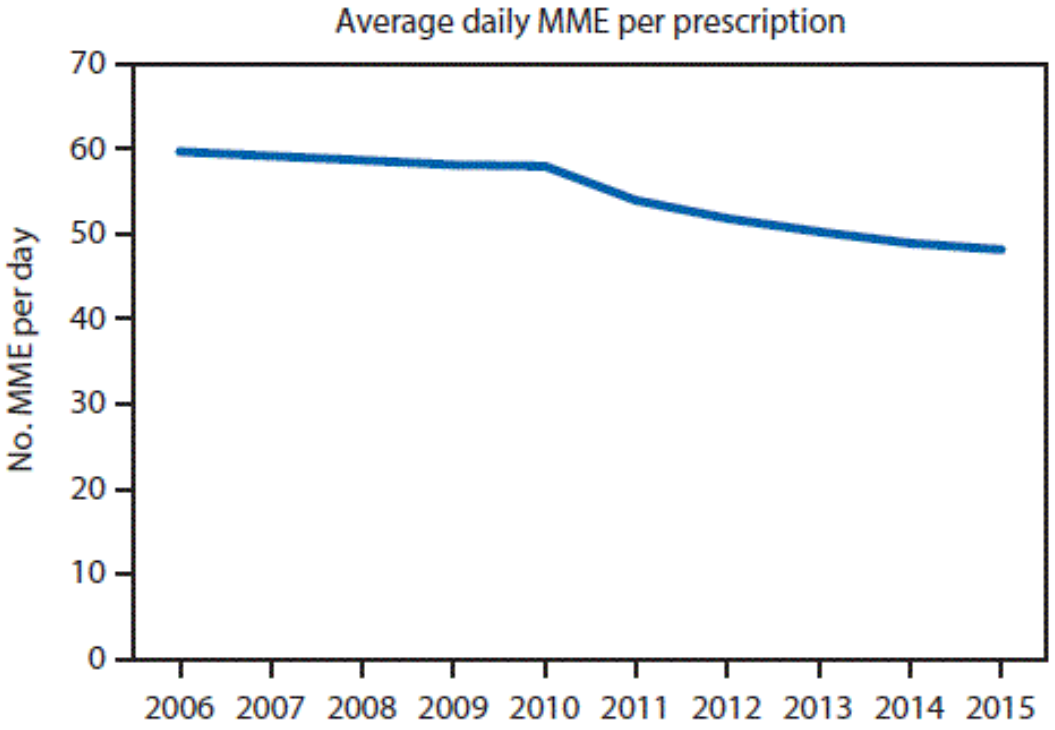
  - Distribution of daily mg of methadone prescriptions (mg, not MME)

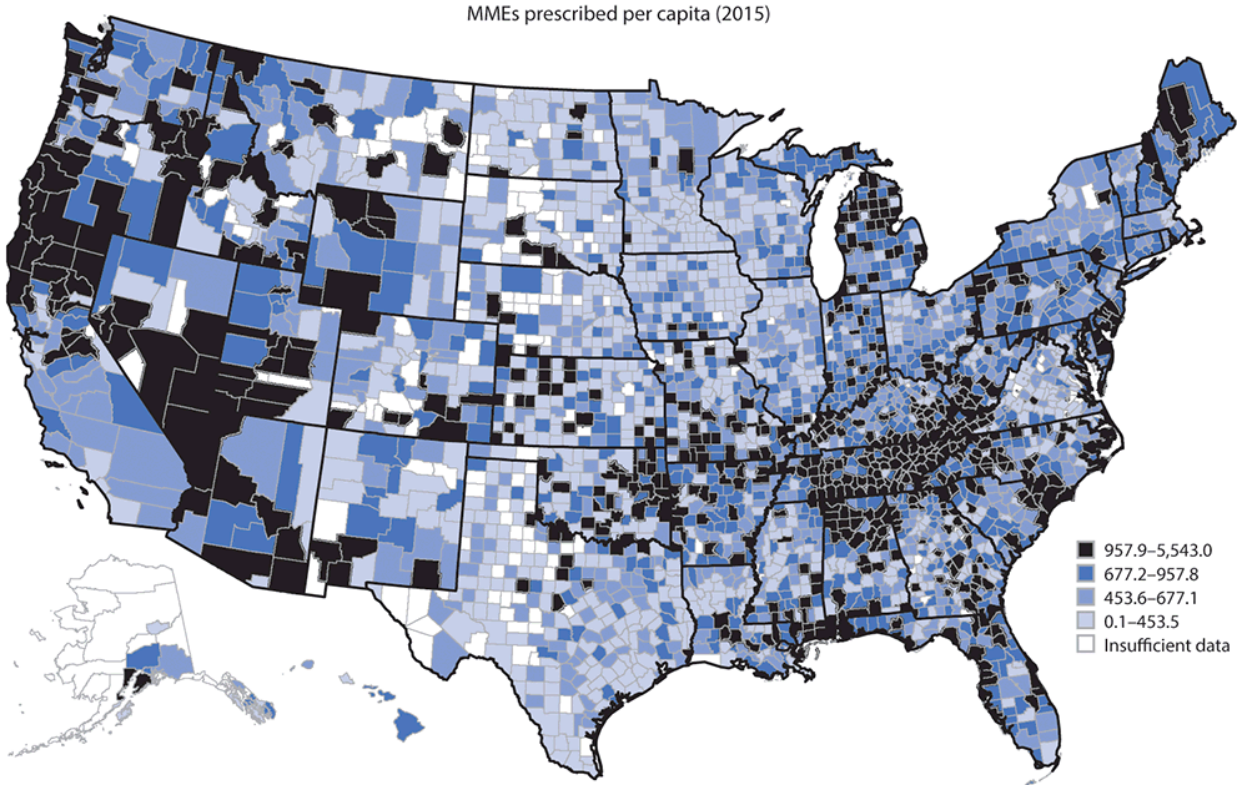
10th Percentile	25th Percentile	50th Percentile	75th Percentile	90th Percentile	Mean
10 mg	20 mg	30 mg	40 mg	70 mg	36 mg

Applications of the file – Surveillance

- Population level claims data or pharmacy dispensing/transaction-based data, e.g., State PDMP

Example of using national level pharmacy dispensing data
CDC Vital Signs: Changes in Opioid Prescribing in the United States, 2006–2015

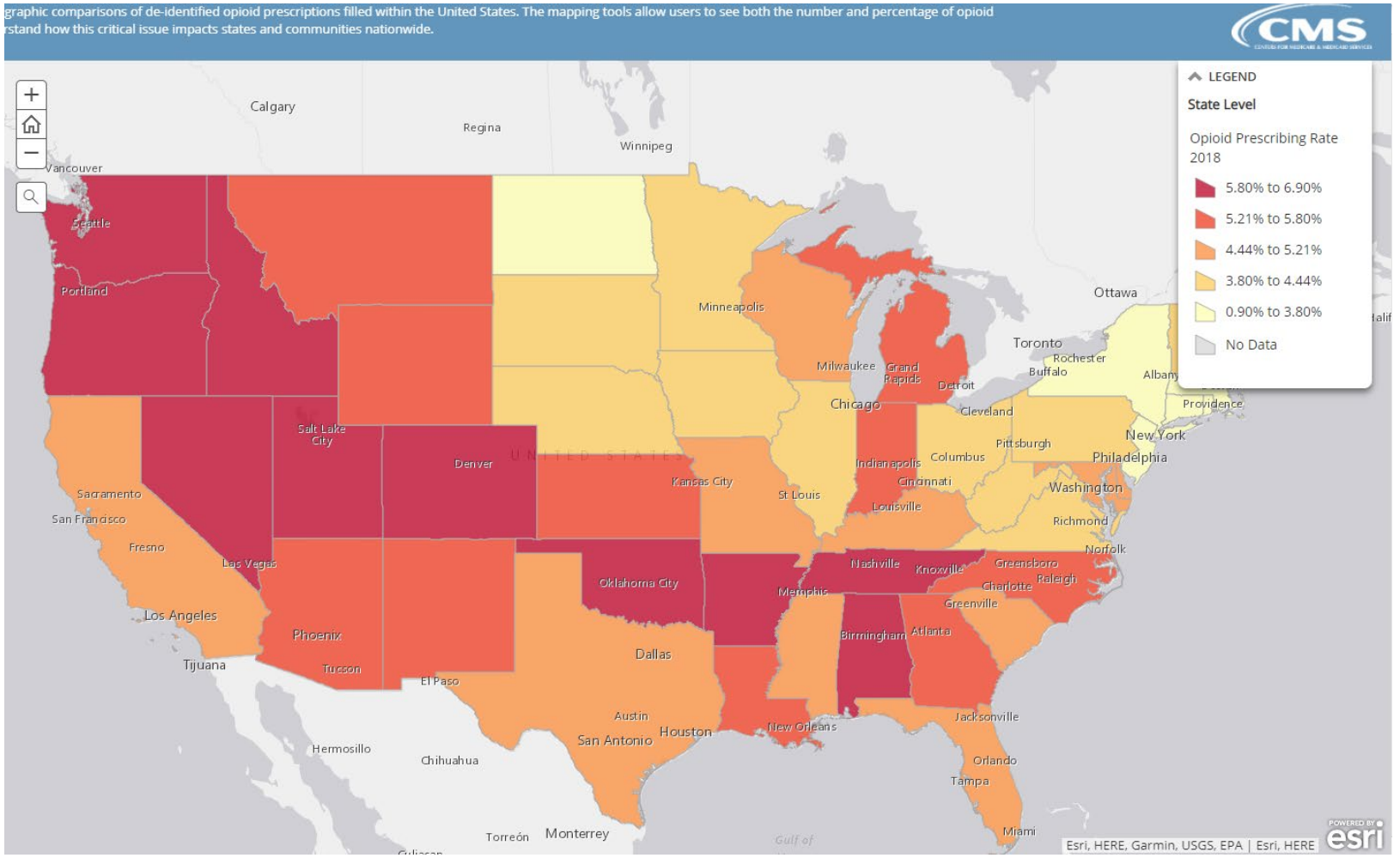




Applications of the file – Surveillance cont.

Example of using CMS claims data (payer)

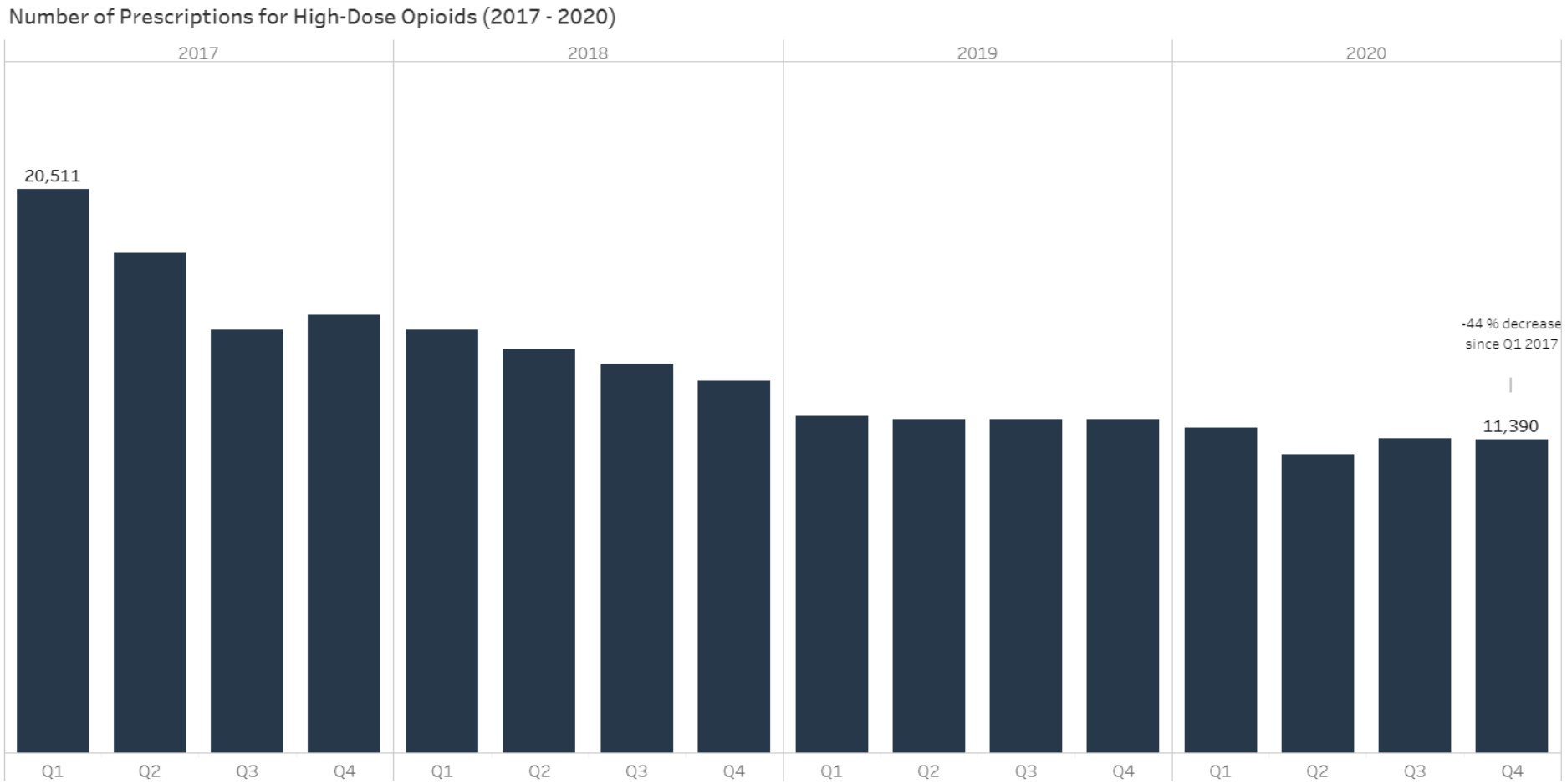
https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/



Applications of the file – Surveillance cont.

Example of using PDMP data: PDMP data dashboard by Rhode Island

https://preventoverdoseri.org/see-the-data/



Applications of the file – cont.

+ Research

- A few examples among many published studies

Original Investigation | Public Health

September 28, 2018

Assessment of Opioid Prescribing Practices Before and After Implementation of a Health System Intervention to Reduce Opioid Overprescribing

Barry R. Meisenberg, MD[1]; Jennifer Grover, PA[1]; Colson Campbell, BS[2]; et al

Author Affiliations | Article Information

JAMA Netw Open. 2018;1(5):e182908. doi:10.1001/jamanetworkopen.2018.2908

Original Investigation | Substance Use and Addiction

March 15, 2019

Trends and Patterns of Geographic Variation in Opioid Prescribing Practices by State, United States, 2006-2017

Lyna Z. Schieber, MD, DPhil (Oxon)[1]; Gery P. Guy Jr, PhD, MPH[1]; Puja Seth, PhD[1]; et al

Author Affiliations | Article Information

JAMA Netw Open. 2019;2(3):e190665. doi:10.1001/jamanetworkopen.2019.0665

Research Full Report

High-Risk Opioid Prescribing Trends: Prescription Drug Monitoring Program Data From 2010 to 2018

Sarah J. Ball, PharmD; Kit Simpson, DrPH; Jingwen Zhang, MS; Justin Marsden, BS; Khosrow Heidari, MA, MS; William P. Moran, MD, MS; Patrick D. Mauldin, PhD; Jenna L. McCauley, PhD

Trends in Dispensed Opioid Analgesic Prescriptions to Children in South Carolina: 2010–2017

William T. Basco, Jr, MD, MS,[a] Jenna L. McCauley, PhD,[b] Jingwen Zhang, MS,[c] Patrick D. Mauldin, PhD,[c] Kit N. Simpson, DrPH,[d] Khosrow Heidari, MA, MS,[e] Justin E. Marsden, BS,[c] Sarah J. Ball, PharmD[c]

FDA Analysis of Long-Term Trends in Prescription Opioid Analgesic Products: Quantity, Sales, and Price Trends

March 1, 2018

Introduction

The NEW ENGLAND JOURNAL of MEDICINE

SPECIAL ARTICLE

Initial Opioid Prescriptions among U.S. Commercially Insured Patients, 2012–2017

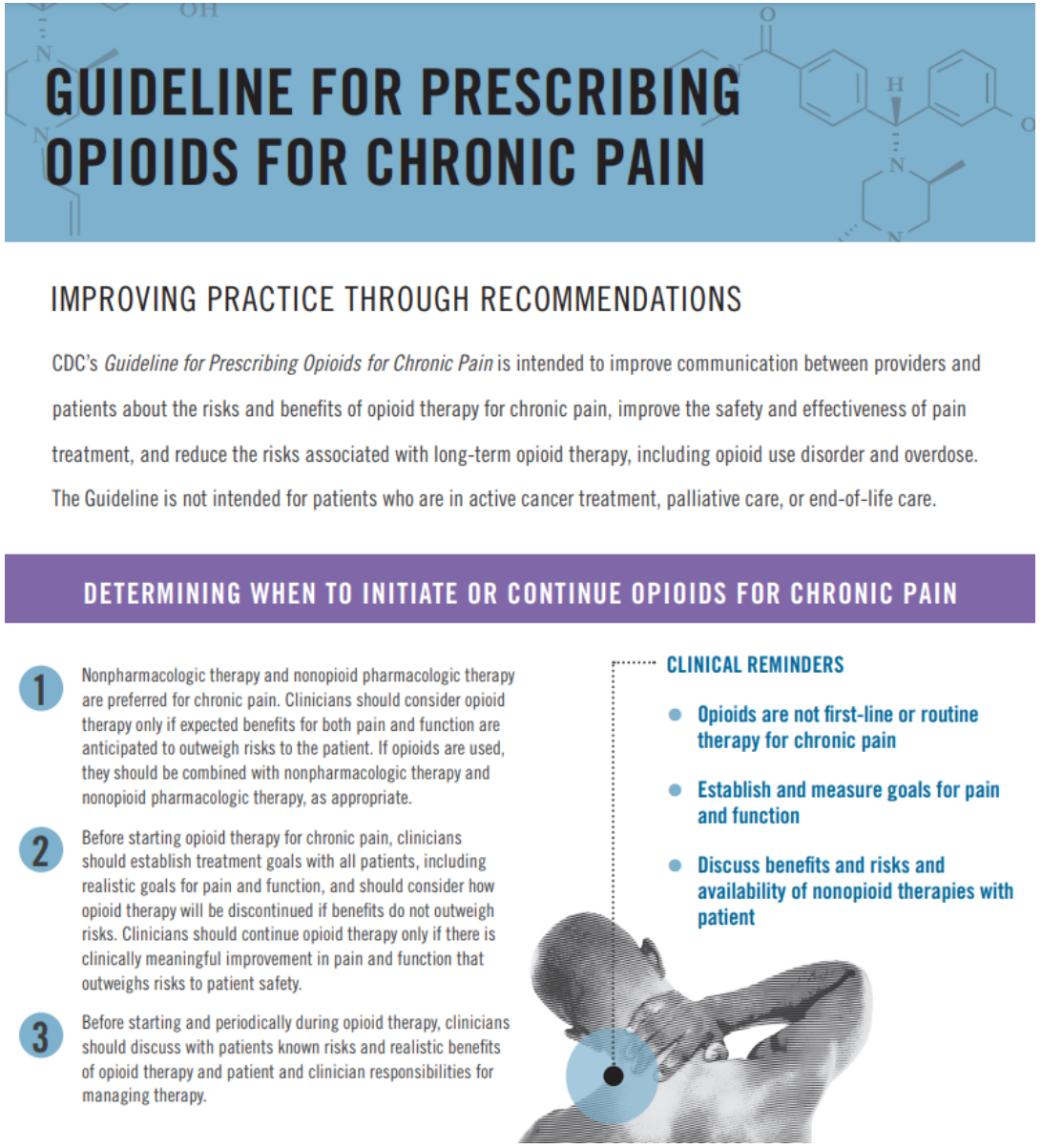
Wenjia Zhu, Ph.D., Michael E. Chernew, Ph.D., Tisamarie B. Sherry, M.D., Ph.D., and Nicole Maestas, M.P.P., Ph.D.

Agenda

+ What is the “Opioid NDC and MME Analytical File”
+ Purpose & Development of the file
+ Applications of the file
+ **Important Distinction**

Important Distinction

+ **The opioid NDC and MME analytical file is NOT intended for any clinical decision-making by clinicians while prescribing opioids**
  - The oral MME conversion factors in this file should NOT be used directly by clinicians to calculate prescribed daily dosage for a patient
  - The oral MME conversion factors in this file DO NOT constitute any clinical guidance or recommendations for converting patients from one form of opioid analgesic to another



https://www.cdc.gov/drugoverdose/pdf/prescribing/Guidelines_Factsheet-a.pdf

MME for Commonly Prescribed Opioids

+ https://www.cdc.gov/drugoverdose/prescribing/guideline.html#tabs-2-3

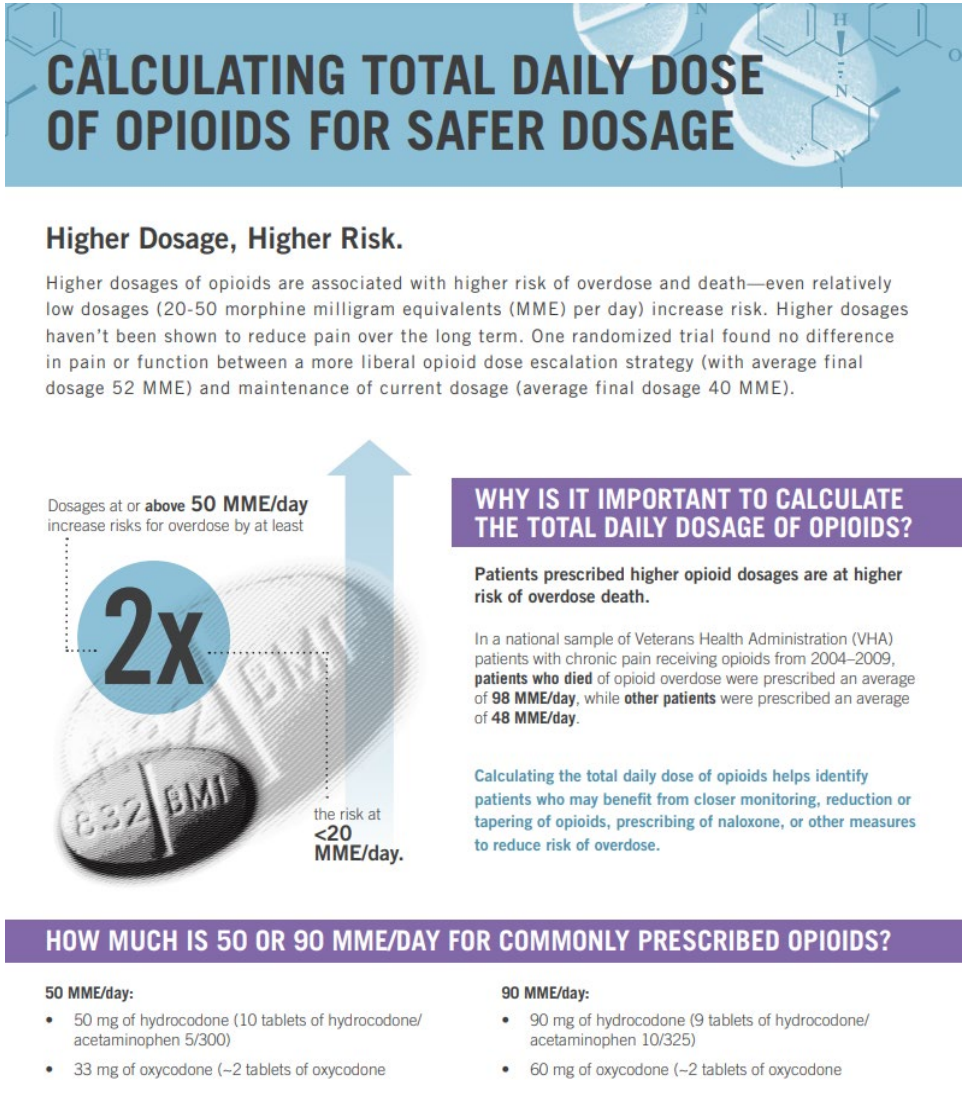
+ Additional clinical guidance, including opioid prescribing for acute pain, may be available through manufacturers' full prescribing information (https://dailymed.nlm.nih.gov/dailymed) or consultation with other clinicians with expertise and experience in pain management.

MME for Commonly Prescribed Opioids

OPIOID (doses in mg/day except where noted)	**CONVERSION FACTOR**
Codeine	0.15
Fentanyl transdermal (in mcg/hr)	2.4
Hydrocodone	1
Hydromorphone	4
Methadone	
1-20 mg/day	4
21-40 mg/day	8
41-60 mg/day	10
≥ 61-80 mg/day	12
Morphine	1
Oxycodone	1.5
Oxymorphone	3

These dose conversions are estimated and cannot account for all individual differences in genetics and pharmacokinetics.

https://www.cdc.gov/drugoverdose/pdf/calculating_total_daily_dose-a.pdf



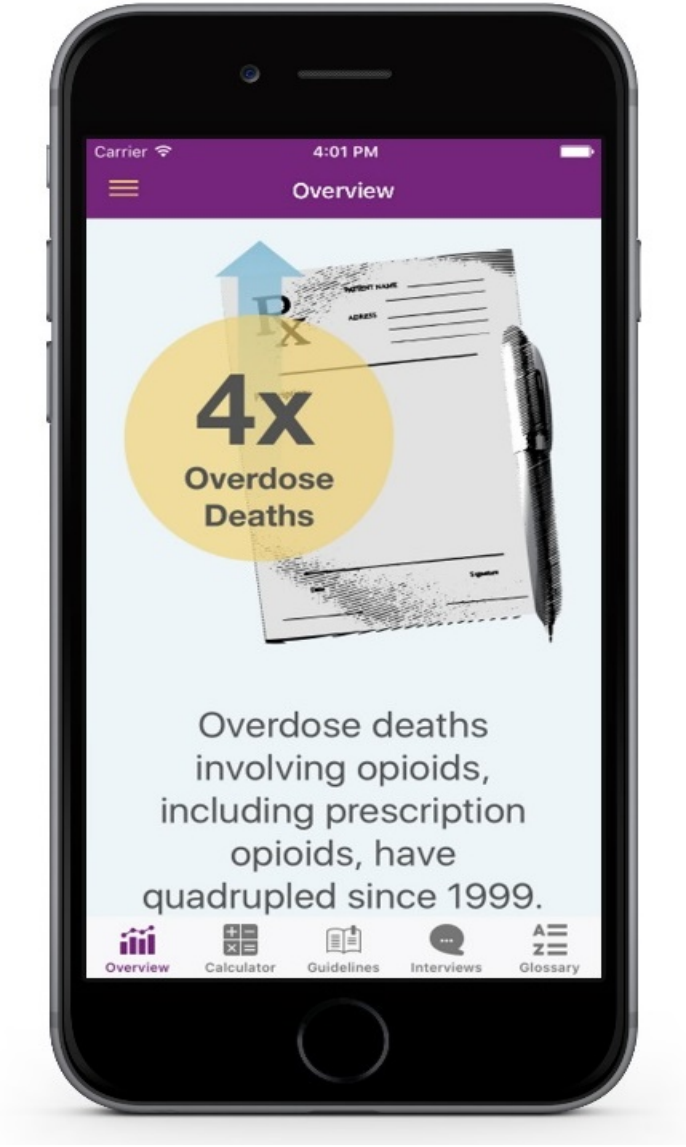
Mobile App

APP includes:

+ MME Calculator of commonly prescribed opioids
+ Prescribing Guidance
+ Motivational Interviewing
  - To help providers practice communication skills and prescribe with confidence

GUIDELINE FOR PRESCRIBING OPIOIDS FOR CHRONIC PAIN

www.cdc.gov



Where to find: https://www.cdc.gov/drugoverdose/prescribing/guideline.html#anchor_1561563251

Thank you!

The findings and conclusions in this presentation are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.