

Comparison of Three Carbon Monoxide Databases in Connecticut

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Purpose

- To understand the data sources available in Connecticut
- To provide a basis for improving or merging data sets
- To provide information for developing policies and/or regulations

Methods

- Obtain information from three data sets for given time period (2000-2004)
- Conduct capture/recapture analysis
- Look for overlap or unique data

Normal COHb Determinations

Category	Typical COHb
Endogenous production	0.4 – 0.7%
Pregnant women	0.4 – 2.6%
Infants	0.5 – 4.7%
Average adult	1.0 – 5.0%
Hemolytic anemia	Up to 6%
Occupational limit	10%
Smoker (2 packs/day)	10%

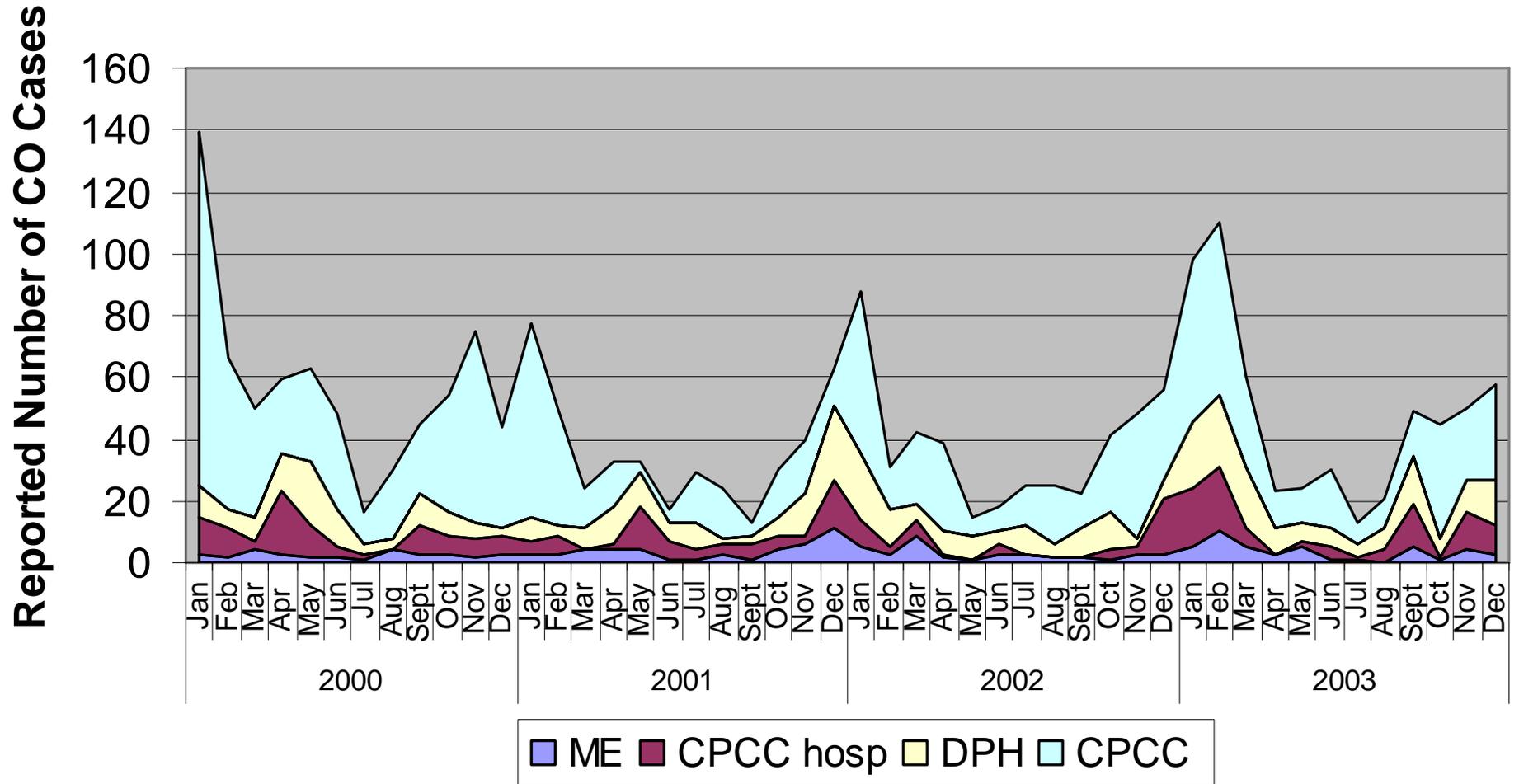
Potential Sources of CO Data

- DPH reporting
 - Hospital or physician-based
 - 434 reported cases (2000-2004)
- CT Poison Control Center (CPCC)
 - Lay caller or health care facility initiated
 - 309 hospital-initiated calls (2000-2004)
- Medical Examiner's (ME)
 - Fatalities evaluated by OCME
 - 183 cases (2000-2004)

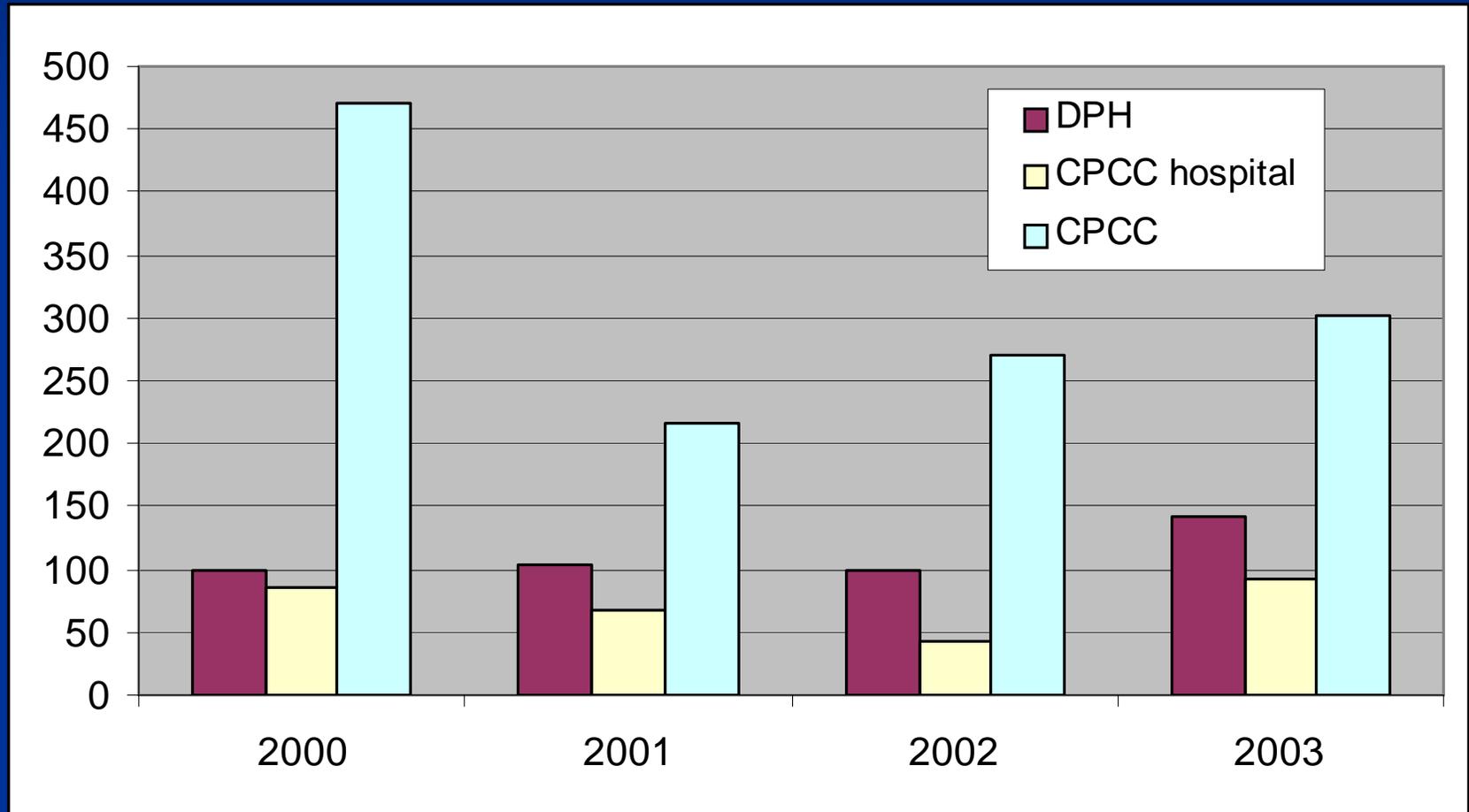
Characteristics of Data Sources

DPH	CPCC – HCF	ME Office
Hospital-lab initiated	Clinician initiated	Medical examiner initiated
Written report	Telephone call	Autopsy records
Retrospective	Real time	Real time
Individuals identified	Patient care recommendations	Documents cause of death

Variability Between Databases



Carbon Monoxide Reporting According to CPCC and DPH



Overlap Between Reporting Systems

- Little overlap between CPCC, ME and DPH databases
 - Only one case appeared in both CPCC and ME systems
 - Only three cases appeared in both DPH and ME systems

Overlap between CPCC and DPH 2000-2004

- Out of 434 cases reported to DPH and 309 hospital-initiated cases reported to CPCC ONLY 75 cases were shared
- Neither database is a complete indicator of CO poisoning in CT

Precautions With Raw Data

- COHb does not correlate well with toxicity
- None of the databases was designed as a surveillance or comprehensive tracking tool
- None of the databases are complete
- Hard to identify suicide and fire-related cases in DPH and ME data

Internal Accuracy of Databases

- DPH database- 437 reports included
 - 3 duplicated reports
 - 6 multiple visits
 - 4 individuals w/2 visits, 2 individuals w/3 visits
 - 434 cases involving 426 individuals
- CPC database (hospital-originated calls) – 309 reports included
 - Due to software issue, 23 cases were selected as CO when diagnosis was
 - toxic products of combustion or
 - smoke inhalation

Refinements of Raw Data

- Over-counting of CO cases by CPCC (Toxicall) and ME
- Under-counting of CO cases by DPH
- More accurate COHb from DPH reports
- Demographic information is more accurate in DPH and ME database from written reports
- CPCC narrative info provides potential for intervention
- No narrative info in DPH database

Medical Examiner CO Deaths

Year	Total # CO Deaths	Mean Age	Mean COHb% (range)
2000	32	52	70.5 (36-91)
2001	45	46	62 (2-87)
2002	38	50	58 (18-83)
2003	43	48	63 (10-82)
2004 (partial)	25	52	60 (34-78)

Comparison of Fatalities and Survivals Between Reporting Systems

		COHb Range
Fatalities	Medical Examiner (183)	63.5% (2-90.3%)
	CPCCC – HCF (7)	46% (30-72%)
	DPH (3)	47.7% (40-57%)
Survivals	CPCCC – HCF (302)	9.5% (0.08-47%)
	DPH – HCF (431)	17% (9-75%)

Carbon Monoxide Alarms Prevent Injury

CPC-reported COHb Levels

	CO Detector Present	CO Detector Not Mentioned
2000	4.0 *	14.2*
2001	2.5#	13.8#
2002	N/A	15.0
2003	8.1#	14.4#
2004 (partial)	2.8*	14.9*

* denotes significant at $p \leq 0.05$

denotes $p=0.06$

Are CT Hospitals Aware of CO Reporting Requirements?

- Reporting requirement for CO
 - COHb > 9% since 1997
 - Laboratory Report of Significant Findings (OL-15C)
 - Physician reporting of CO poisoning
 - Very poor
- 23 out of 31 (74%) hospital laboratories aware
- Hospital reporters' impression:
 - Very few CO reports per year (5-8 per hospital)

Next Steps

- Review all CPCC calls originating from home or other non-hospital site and compare to DPH data
- Separate accidental from non-accidental exposures
- Evaluate possibilities of electronic merging of databases and development of data filters
- Apply principles to other agents
 - Biopreparedness and Environmental Public Health Tracking grants (CDC/DPH)
 - NIOSH Occupational Exposure Tracking
- Revisit CO alarm legislation/regulation