# Back in Barcelona: The Landscape of Database Research Over the Last Decade

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## CONFLICT OF INTEREST STATEMENT

There are no conflicts of interest to disclose.

## BACKGROUND

- Automated health care databases often meet the need for a cost-effective and efficient means of conducting postauthorization studies and have fuelled the use of pharmacoepidemiology research.
- Although use of databases in pharmacoepidemiology research has increased in the last 2 decades, little research has been done on their use.

## OBJECTIVE

- To quantify the contribution to pharmacoepidemiology research of studies conducted in automated health care databases over the last decade.

## METHODS

We reviewed the abstracts published in the *Pharmacoepidemiology and Drug Safety* supplements in 2000 (ICPE Barcelona) and 2011 (ICPE Chicago). Data abstraction was conducted by four epidemiologists using a predefined abstraction form. Abstracts of studies conducted in databases were identified and classified by the following criteria:

- Database definition
  - Electronic medical or administrative health records with individual, longitudinal, and person-level data
- ICPE year
  - 2000
  - 2011
- Study goals
  - Drug utilization studies/risk minimization
  - Safety endpoint
  - Natural history of diseases
  - Validation of diagnostic codes
  - Other: effectiveness, epidemiology methods, statistical methods, surveillance
- Number of databases
  - Single database
  - Several databases
- Country of the population database
- World region of the population database
  - North America, South America, Europe, Asia Pacific, Africa

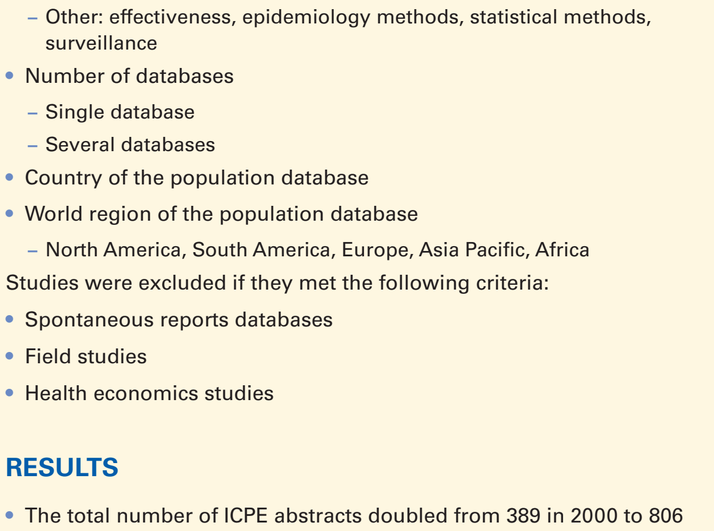
Studies were excluded if they met the following criteria:

- Spontaneous reports databases
- Field studies
- Health economics studies

## RESULTS

- The total number of ICPE abstracts doubled from 389 in 2000 to 806 in 2011.
- Studies conducted in databases contributed 36% (n = 139) of the total number of abstracts in 2000 and 45% (n = 360) in 2011 (Figure 1).

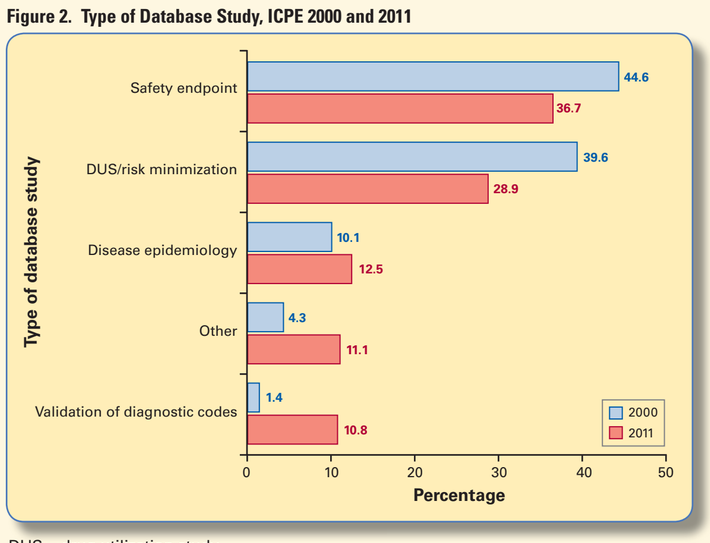
**Figure 1. Abstracts Presented at ICPE 2000 and 2011**




Among database studies, the most frequent study goal in both 2000 and 2011 was safety endpoint (44.6% in 2000 and 36.7% in 2011), followed by drug utilization/risk minimization, disease epidemiology, other, and validation (Figure 2).

- The studies categorized as other were further classified as:
  - 2000: epidemiological methods (n = 4), statistical methods (n = 1), and effectiveness (n = 1)
  - 2011: epidemiological methods (n = 14), statistical methods (n = 14), effectiveness (n = 9), surveillance (n = 2), and other not falling into any of the previous categories (n = 1).
- The percentage of abstracts on database validation studies increased from 1% in 2000 to 11% in 2011.
- The percentage of database studies on safety endpoints and drug utilization studies/risk minimization decreased in 2011 compared with 2000, while the opposite occurred with the other types of studies.

**Figure 2. Type of Database Study, ICPE 2000 and 2011**




DUS = drug utilization study.

- The majority of database studies were single database studies, but the percentage of database studies using multiple database nearly doubled from 6.5% (n = 9) in 2000 to 11.9% (n = 43) in 2011 (Table 1).

**Table 1. Number of Single and Multiple Database Studies Among All Database Studies Presented at ICPE 2000 and 2011**

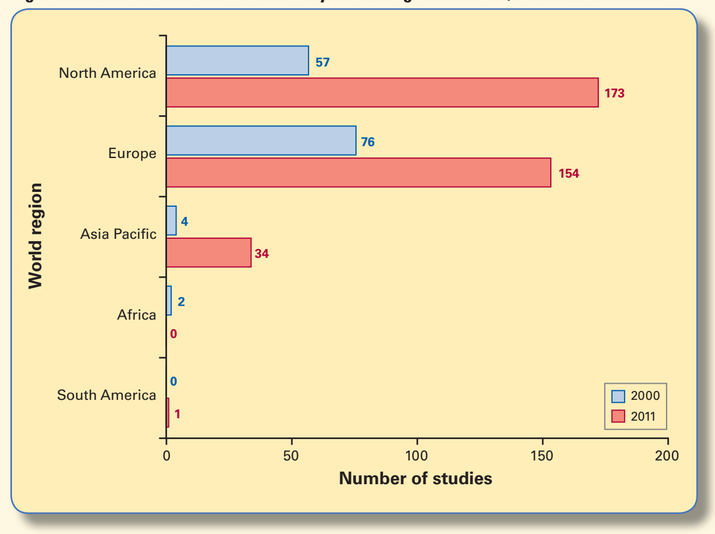
| Number of Databases | 2000 | 2011 | Total |
|---|---|---|---|
| | n (%) | n (%) | |
| 1 | 130 (93.5) | 317 (88.1) | 447 |
| > 1, of which: | 9 (6.5) | 43 (11.9) | 52 |
| 2 | 5 (3.6) | 17 (4.7) | 22 |
| 3 | 2 (1.4) | 12 (3.3) | 14 |
| 4 | 1 (0.7) | 3 (0.8) | 4 |
| 5 | 0 | 2 (0.6) | 2 |
| 6 | 0 | 1 (0.3) | 1 |
| 7 | 0 | 7 (1.9) | 7 |
| 8 | 1 (0.7) | 1 (0.3) | 2 |
| **Total** | **139** | **360** | **499** |

- The number of countries with database studies increased from 14 in 2000 to 21 in 2011. The increase was primarily in Europe (mainly Norway, Finland, and Iceland) and the Asian Pacific region (Taiwan and Japan).
- Countries with more than 20 studies conducted in databases were the United States (US), the United Kingdom (UK), and Canada in 2000, and the US, the UK, the Netherlands, Denmark, and Canada in 2011.
- Ten countries not represented in 2000 had database studies in 2011: Brazil, Finland, Iceland, Israel, Japan, Lithuania, Norway, Portugal, Switzerland, and Taiwan. The countries with the highest increase in the number of abstracts with database studies were Taiwan (0 in 2000 and 21 in 2011) and Norway (0 in 2000 and 11 in 2011). Only two countries that had database studies in 2000 were not represented in 2011 (Ireland and South Africa).

**Figure 3. Number of Database Studies by Country, ICPE 2000 and 2011**


- In 2000, Europe was the region with the highest number of database studies (n = 76), followed by North America (n = 57).
- In 2011, the North American region had the highest number of database studies (n = 173).
- The Asian Pacific region was the world region with the largest proportional growth in database studies, with 4 abstracts in 2000 and 34 in 2011.

**Figure 4. Number of Database Studies by World Region and Year, ICPE 2000 and 2011**




## CONCLUSIONS

- Over the last decade, there has been a remarkable expansion in the following between 2000 and 2011:
  - Number of pharmacoepidemiology studies conducted using databases
  - Number of countries where pharmacoepidemiology research is conducted using databases
  - Studies using multiple databases from within a single country and across countries
  - Database validation studies.

## REFERENCES

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Pharmacoepidemiol Drug Saf. 2011 Aug;20(Suppl1).

## CONTACT INFORMATION

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