EpiData: The Relevance for Local/Regional Risk Factor Surveillance

CARRFS e-learning session

September 24, 2010

EpiData

Outline

- Association of Public Health Epidemiologists in Ontario & the EpiData Association
- APHEO EpiData Evaluation & Redevelopment Project
- EpiData Entry and Analysis
- Examples: Uses in Surveillance
- The Future of EpiData
- Q & A

APHEO

- The Association of Public Health Epidemiologists in Ontario - organization of ~ 75 full members who practice epidemiology in Ontario's public health units, as well as more than 100 affiliate members.
- Formed in 1991.
- **APHEO's Mission:** To advance and promote the discipline and professional practice of epidemiology in Ontario public health units.
- www.apheo.ca

EpiData Association

- Creator of EpiData software - 1999
- Lead by Jens Lauritsen, MD.
- www.epidata.dk

APHEO EpiData Project

- Funded by Public Health Agency of Canada since 2007
- Purpose: APHEO supports and influences the further development of EpiData to improve its utility in the field and as a training tool.
- Project Goals:
  - Improved EpiData functions that are well suited to the practice of public health in Canada
  - Production of test versions and documentation of EpiData software and Canadian case studies to illustrate the management and analysis of data in the field
  - The software, documentation and case studies will be used by public health practitioners and trainers in Canada to complement existing surveillance software, analysis software and training tools.
- EpiData Project website: http://www.apheo.ca/index.php?pid=47

EpiData Software Overview

EpiData Entry

EpiData Analysis

History

- 1976–1995: EpiInfo (DOS program) created by Centers for Disease Control and Prevention (CDC)
- 2000: CDC releases EpiInfo2000
  - Based on Microsoft Jet (Access) data engine
  - Massive changes
- 2001: Loyal EpiInfo user group decides it needs real "EpiInfo for Windows"
  - Creates open source public domain program
  - Calls program "EpiData"

EpiData

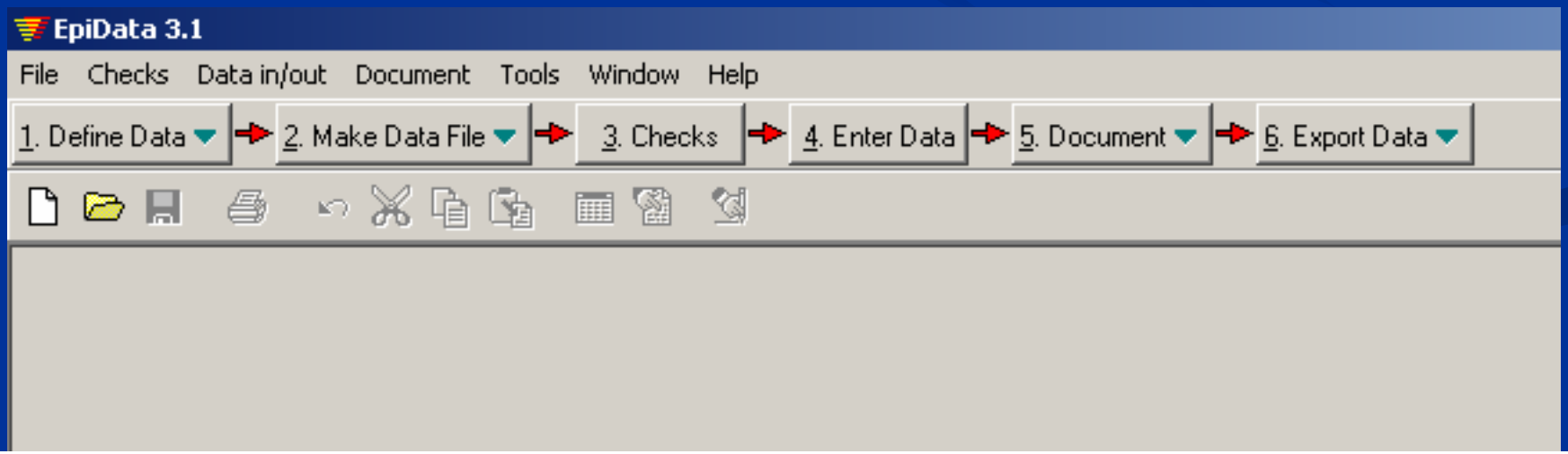
- Public domain software package for use by public health professionals and researchers
- Two components:
  - EpiData 3.1 for data entry
  - EpiData Analysis (v.2.1)
- Suitable for survey datasets
- Translated in several languages
- Downloaded from the EpiData website: www.epidata.dk

EpiData Entry

- Data entry based on a questionnaire
- Data documentation
- Protect the database from input errors by writing a ‘check’ program
- Import and export data
- Error detection features. E.g. double entry verification
- Support for relational databases

EpiData Entry in Steps

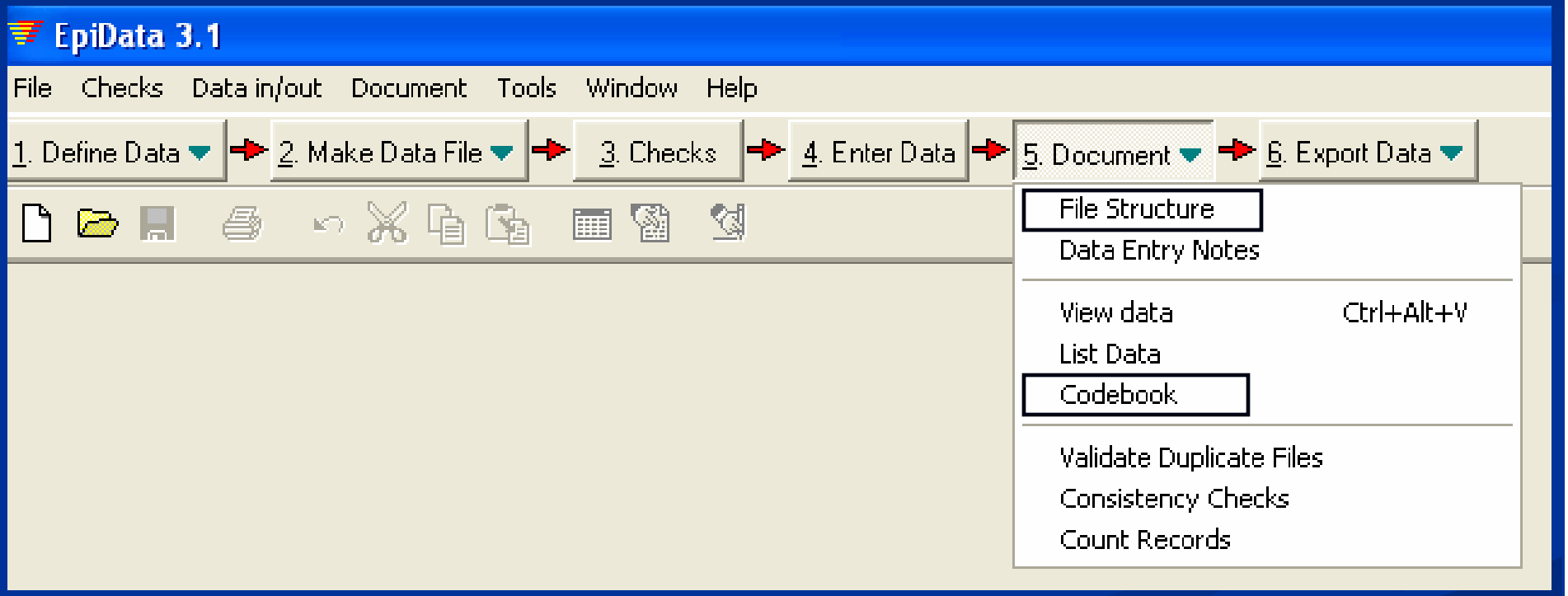
- Define data (QES file)
- Make data file (REC file)
- Checks (CHK file)
- Enter data
- Document
- Export data



Codebooks

- Contain info that helps users decipher data file content and structure
- Includes:
  - Filename(s)
  - File location(s)
  - Variable names
  - Codes and their associated meanings

EpiData Codebook Generators



File Structure Codebook

```
DATA FILE:              C:\Data\datasets\demo.rec
File label:             Class demonstration

File size:              395 bytes
Last revision:          28. Apr 2005 1:48 PM
Number of fields:       5
Number of records:      2
Checks applied:         Yes (Last revision 28. Apr 2005 1:45 PM)


Fields in data file:

No. Name       Variable label        Field type      Width  Checks                Value labels
-----------------------------------------------------------------------------------------------
  1 fname                            Text            10

  2 lname                            Upper-case text 10

  3 dob                              Date (mdy)      10

  4 sex                              Number          1                            sex
                                                                                  1: Male
                                                                                  2: Female
                                                                                  9: Unknown

  5 deathage                         Number          3

-----------------------------------------------------------------------------------------------
```

Full codebook contains descriptive statistics

EpiData Analysis

- Descriptive statistics (i.e., sum, mean, min, max, frequencies, etc.)
- Define/modify data
- Produce graphs & tables
  - Summary statistics, confidence intervals
  - Linear regression, correlations
  - Stratified analysis
  - Outbreak focused analysis (i.e., attack rate tables, epi curves)
  - Survival curves Life table and Kaplan-Meir plots
  - Comprehensive data management: recode variables, define missing values, label values and label variables.

Examples

Uses of EpiData in Public Health Surveillance

WHO - STEPwise approach to surveillance (STEPS)

- a simple, standardized method for collecting, analysing and disseminating data in WHO member countries.
- 2 STEPS surveillance systems:
  - Adult chronic disease risk factor
  - Stroke
- EpiData templates available that provide the generic code used during data entry that matches the STEPS Instrument.
- http://www.who.int/chp/steps/en/

Data Entry Assistance – Coding pop- screens

le Goto Filter Window Help

World Health Organization

WHO STEPwise approach to NCD risk factor surveillance

STEPS Data Entry Instrument v2.0

: Participant Identification Number

LOCATION AND DATE INFORMATION

District Code

Cluster/Centre/Village Name

Cluster/Centre/Village Code

Interviewer Code

Date Completed Instrument

STEP 1: Questionnaire

MOGRAPHIC INFORMATION

Sex

What is your date of birth (leave blank if 77/77/7777)

How old are you?

In total, how many years have you spent at school?

What is your ethnic background?

What is the highest level of education you have completed?

Which of the following best describes your main work status?

How many people older than 18 live in your household?

C6 - Select value

1 - No formal schooling

1	-	No formal schooling
2	-	Less than primary school
3	-	Primary school completed
4	-	Secondary school completed
5	-	High school completed
6	-	College/University completed
7	-	Post graduate degree
77	-	don't know
88	-	refused
99	-	missing

New/0 *

Integer: Press + or F9 to see legal values | Length: 2

EpiData 3.1 - [Add / revise checks - survey.rec]

File Filter Fields Window Help

STEP 2: PHYSICAL MEASURES

HEIGHT AND WEIGHT

M1 Interviewer ID

M2A Device ID for height

M2B Device ID for weight

M3 Height

M4 Weight

M5 Participant pregnant

WAIST

M6 Device ID

M7 Waist circumference

BLOOD PRESSURE

M8 Interviewer ID

M9 Device ID

M10 Cuff Size

M11A Systolic Reading 1

M11B Diastolic reading 1

M12A Systolic Reading 2

M12B Diastolic reading 2

M13A Systolic Reading 3

M13B Diastolic reading 3

M14 On treatment with drugs?

HIP CIRCUMFERENCE

M15 Hip circumference

HEART RATE

Edit checks for this field

Edit Accept and Close Cancel Help

```
M3
  AFTER ENTRY
    IF (M3=.) THEN
      HELP "A value must be entered. Please enter a value or use: 888.8 for refused 999.9 for missing."
      GOTO M3
      EXIT
    ENDIF
    IF (((M3<100) OR (M3>270)) AND (M3<>999.9) AND (M3<>888.8)) THEN
      HELP "Height must be between 100 and 270. Please re-enter or use: 999.9 for missing."
      GOTO M3
      EXIT
    ENDIF
  END
END
```

Data Quality Assurance – Check commands

Multi-Drug Resistant Tuberculosis

- **Study Objective:** observational study - evaluates effectiveness of standardized regimens for patients with proven multi drug-resistant tuberculosis previously untreated with second-line drugs in low income countries.
- Consenting patients sequentially assigned to one of six standardized treatment regimens.
- Reported the treatment outcome of all patients with laboratory-confirmed, multi drug-resistant tuberculosis enrolled from May 1997 to December 2007.

- Treatment records captured in EpiData Entry
- Analysis in EpiData Analysis:
  - 95% confidence intervals (CI) for proportions and P values where appropriate
  - Kaplan-Meier survival statistics with 95% CI

Source: Short, Highly Effective, and Inexpensive Standardized Treatment of Multidrug-resistant Tuberculosis. Am J Respir Crit Care Med Vol 182. pp 684–692, 2010

TB Case Registry – Assessing Data Quality

- **Study Objective:** To determine completeness and consistency of information for quarterly reports on case finding and treatment outcome.
- **EpiData Entry:** Data were double-entered and validated for any discordance by comparing the discordant values against the original physical case register and making corrections where appropriate.
- **EpiData Analysis**: frequencies, summaries

Source: Completeness and consistency in recording information in the tuberculosis case register, Cambodia, China and Viet Nam. INT J TUBERC LUNG DIS 14(10):1303–1309

Durham Region Health Unit – 'DineSafe Durham' Evaluation

- DineSafe Durham - new program to increase compliance with the Ontario Food Premises Regulations and increase transparency of, and public accessibility to, food safety inspection results and information.
- Colour-coded food safety inspection signs posted at the entrance to food establishments
- Evaluation Question: Have attitudes towards food safety practices changed one year post-implementation?

- Method: telephone survey of owners/operators to obtain feedback on the potential impact of DineSafe Durham on business and food safety handling practices
- EpiData Entry: real-time data entry by telephone interviewers

File Goto Filter Window Help

Q1. How has DineSafe Durham, the disclosure of the inspection results affected your business?
Would you say very positively (1), somewhat positively (2), has made no impact (3), somewhat negatively (4),
or very negatively (5)?
q1

1.Very positively
2.Somewhat positively
3.No impact
4.Somewhat negatively
5.Very negatively
8.Don't know
9.Refused

Q2. How much change, if any, has occurred in your food handling practices as a result of DineSafe Durham?
Would you say there has been significant change (1), some change (2), little change (3), or no change (4)?
q2

1.Significant change
2.Some change
3.Little change
4.No change
8.Don't know
9.Refused

Q3. How much change, if any, has DineSafe Durham made to the way you meet the Ontario Food Premises Regulations?
Would you say there has been significant change (1), some change (2), little change (3), or no change (4)?

(ONLY READ IF AN EXPLANATION IS REQUIRED): The Ontario Food Premises Regulations are the primary pieces of legislation

Easy to Load Data Files

EpiData Analysis V2.2.1.171 I:\DineSafe Durham\Evaluation 2009_2010\DineSafe Phase 1\Questionnaire - O

File Edit Data Windows Results Help

Close Read Browse Graph Analysis Editor Quit

```
. read
Loading data I:\DineSafe Durham\Evaluation 2009_2010\DineSafe Phase 1\Questionnaire - Op
File name :I:\DineSafe Durham\Evaluation 2009_2010\DineSafe Phase 1\Questionnaire - Oper
DineSafe Durham Operatory Telephone Survey
Fields: 11 Total records: 53 Included: 53
```

Analyze using easy-to-create Programs

I:\DineSafe Durham\Evaluation 2009_2010\DineSafe Phase 1\Questionn...

File Edit Insert History Run Window Help

```
1 Read "I:\Everyone\Ann Bodnar\DineSafe\OperatorSurvey
2 TABLES colour q1 /C
3 TABLES colour q2 /C
4 TABLES colour q3 /C
5 TABLES colour q4 /C
6 TABLES colour q5 /C
7 TABLES colour q6 /C
8 TABLES colour q7a /C
9 TABLES colour q7b /C
```

EpiData Analysis V2.2.1.171 I:\DineSafe Durham\Evaluation 2009_2010\DineSafe Phase 1\Questionnaire - Operator\Ann Bod

File Edit Data Windows Results Help

Close Read Browse Graph Analysis Editor Quit

```
. TABLES colour q1 /C
Loading data I:\DineSafe Durham\Evaluation 2009_2010\DineSafe Phase 1\Questionnaire - Operator\Ann
Bodnar's files\OperatorSurveyDataEntryScreen.rec, please wait...
File name :I:\DineSafe Durham\Evaluation 2009_2010\DineSafe Phase 1\Questionnaire - Operator\Ann Bodna
files\OperatorSurveyDataEntryScreen.rec
DineSafe Durham Operatory Telephone Survey
Fields: 11 Total records: 53 Included: 53
```

	colour					
q1	green	%	yellow/red	%	Total	%
Very positively	23	{62.2}	8	{50.0}	31	{58.5}
Somewhat positively	2	{5.4}	3	{18.8}	5	{9.4}
No impact	12	{32.4}	5	{31.3}	17	{32.1}
Total	37	{100.0}	16	{100.0}	53	

Percents: {Col}

```
. TABLES colour q2 /C
```

	colour					
q2	green	%	yellow/red	%	Total	%
Significant change	5	{13.5}	4	{25.0}	9	{17.0}
Some change	8	{21.6}	5	{31.3}	13	{24.5}
Little change	12	{32.4}	6	{37.5}	18	{34.0}
No change	12	{32.4}	1	{6.3}	13	{24.5}
Total	37	{100.0}	16	{100.0}	53	

Percents: {Col}

```
. TABLES colour q3 /C
```

	colour					
q3	green	%	yellow/red	%	Total	%

I:\DineSafe Durham\Evaluation 2009_2010\DineSafe Phase 1\Questionn 53 All Selected EAoutput.htm

The Future of EpiData

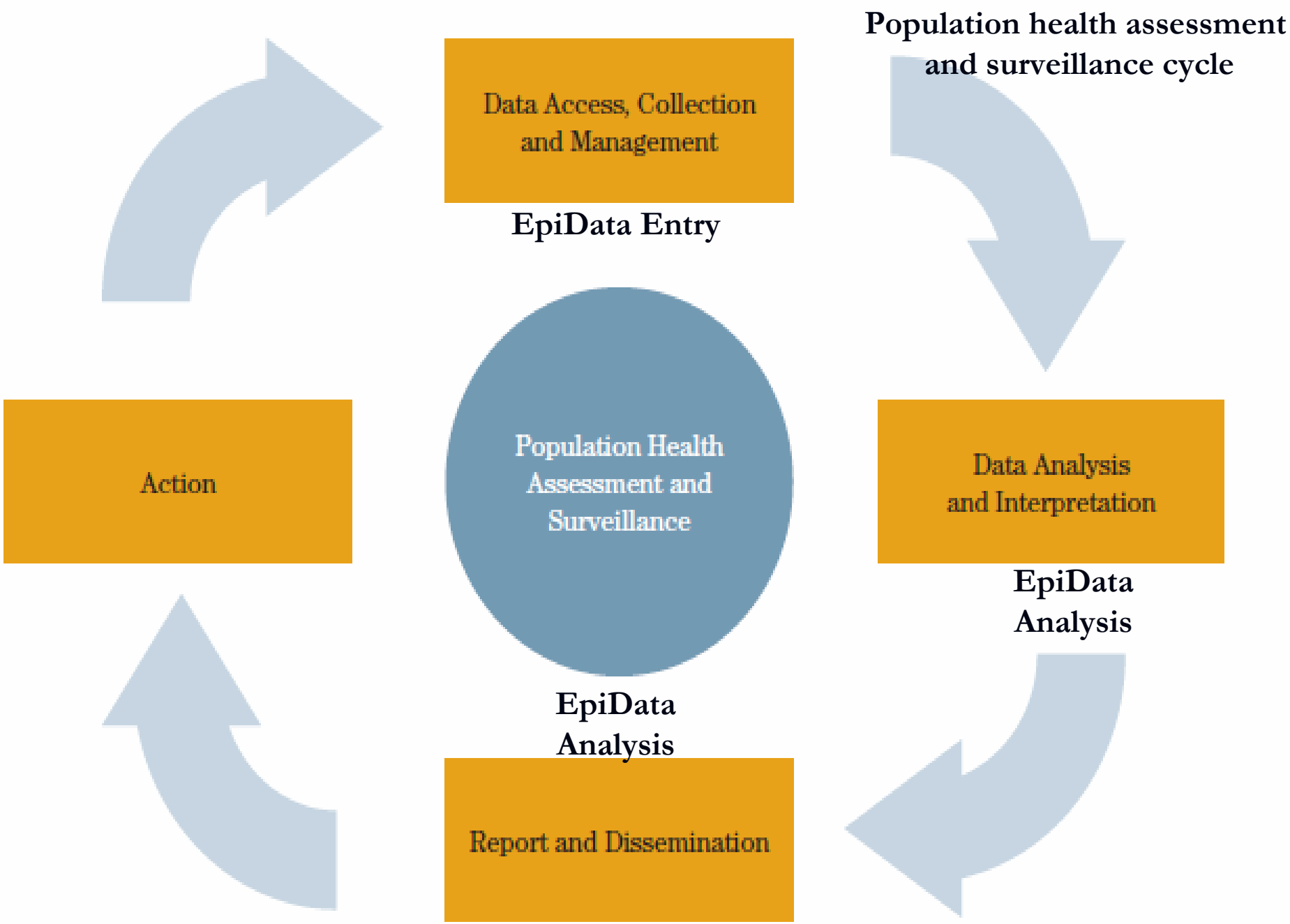
- New: EpiData XML file format "EPX" will combine and replace the current qes, chk and rec files into one physical file
- More access controls
- The re-written software will consist of three parts
  - a. EpiData Data Manager
  - b. EpiData DataEntry Client
  - c. EpiData Analysis
- Public tests of re-written software ongoing

EpiData Benefits

- Easy to use. Although its features may be fewer than more sophisticated packages, the simplicity is a benefit in many situations, particularly for beginners.
- Distributed free of charge.
- Doesn't require a powerful computer to run it.
- Can export data in formats that can be read by virtually every statistical, database, or spreadsheet package.

Benefits cont'd

- Strong network of software developers – listens to users – enhances software to meet local needs
- Very portable – small size, carried on USB sticks, install on as many computers as you like (remember – it's a freeware!). Great for field work.
- Support from other EpiData users via the EpiData listserv



Source: Population Health Assessment and Surveillance Protocol, Ontario Ministry of Health and Long-Term Care, 2008

EpiData Resources

- EpiData Introduction Guide: A Canadian Example (http://www.apheo.ca/index.php?pid=47#Project Documents)
- E-mail based discussion list: http://lists.umanitoba.ca/pipermail/epidata-list/

APHEO EpiData Expert Panel

- Brenda Guarda - Project Manager brenmin@rogers.com
- Camille Achonu - Ontario Agency for Health Protection and Promotion cachonu@gmail.com
- Anne Arthur - Toronto Public Health aarthur@toronto.ca
- John Barbaro - Simcoe Muskoka District Health Unit john.barbaro@smdhu.org
- Jason Garay - York Region Community and Health Services Department jason.garay@york.ca
- Kathy Moran - Durham Region Health Department kathy.moran@durham.ca

References and Training Materials

- Data Management for Surveys and Trials. A Practical Primer using EpiData. http://www.epidata.dk/downloads/dmepidata.pdf
- Data Management Using EpiData. http://www.idready.org/webcast/fall06_materials/outbreak_investigation/2006-09-12/DE_EpiData_v2.ppt#256,1,Data Management using EpiData
- Household Survey on Access and use of Medicines. A training guide on data entry. http://www.who.int/medicines/areas/coordination/training_slides_data_entry.pdf
- STEPS Data Entry Guide. http://www.who.int/chp/steps/Part3_Section5.pdf

References and Training Materials

- A comparison of public domain software for outbreak investigations: Epi Info and EpiData. http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=3111
- Using EpiData and Epi Info for Windows. http://www.wales.nhs.uk/sitesplus/documents/888/EpiData%20Presentation1.pdf
- EpiData Software for Operations Research in Tuberculosis Control. http://www.tbrieder.org/epidata/course_abcd.pdf
  - Accompanying training documents: http://www.tbrieder.org/epidata/course.htm
- EpiData Software – New Users. http://www.epidata.dk/newuser.htm
- Entering data with EpiData. http://folkesundhed.au.dk/fileadmin/www.folkesundhed.au.dk/uddannelse/software/epidata.pdf
- Using of EpiData (questionnaire design and entry). http://www.epinorth.org/dav/FA086CF6D9.ppt#256,1,Use of EpiData (questionnaire design and entry)

References and Training Materials

- EpiData website. www.epidata.dk
  - EpiData Field Guide. http://www.epidata.org/wiki/index.php/Field_Guide
  - EpiData Software: Getting Your first Process Chart in 5 minutes. http://www.epidata.dk/downloads/spc5min_epidata.pdf
  - EpiData Software - Links and Courses. http://www.epidata.dk/links.htm

Thank You!