THE GEORGE INSTITUTE
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Strategies and methodologies for injury surveillance systems and data systems

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What is surveillance?

- "Surveillance", as used in the public health field, refers to the ongoing and systematic collection, analysis, interpretation and dissemination of health information.

- Passive surveillance where the generation of data is not necessarily the primary function of the system. (ex: death certificates, hospital data).

- Active surveillance where cases are sought out and investigated (ex: Active surveillance of child abuse cases)

- "Surveillance" is different than "Surveys" which are usually one-time events

Why do surveillance?

› **Surveillance produces data that describes:**
- The size and characteristics of the problem
- The population at risk
- Risk factors
- Trends of occurrence of a health problem

› **Armed with such data it is possible to:**
- Design and apply appropriate interventions
- Monitor the results and assess the impacts of interventions.
- Advocacy: help arguing for more resources!

Steps in a surveillance system (WHO, 2001)
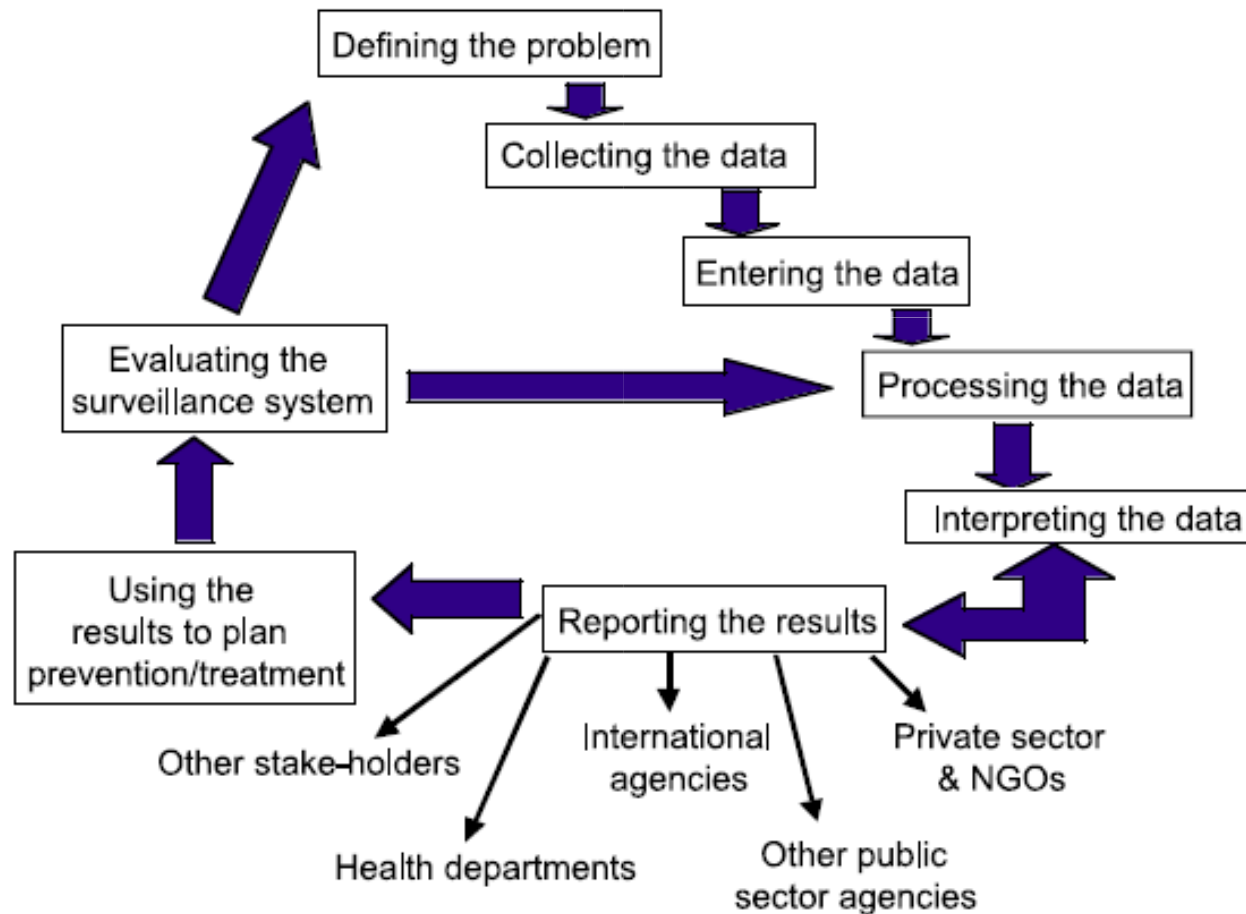
Attributes of a good surveillance system (WHO, 2001)

- **Simplicity**
- **Flexibility**
- **Acceptability**
- **Reliability**
- **Utility**
- **Sustainability**
- **Timeliness**
- **Confidentiality/security**

Sources of injury data

Degrees of Injury Severity

Injury Deaths
Hospitalization
Emergency Dept.
Physician Visit
Households

Building surveillance systems on RTI

- **Need to consider why data is needed**
  - E.g.To assess burden, trends, high risk groups, design and evaluate programs

- **What data is needed?**
  - E.g.Demographics (age, gender, place of residence), external cause, risk factors (alcohol), injury severity (fatal, hospitalized or minor), type of injury (body part? type of injury?)

- **Define a case, and where data on cases may be collected**
  - E.g. RTI requiring treatment, or RTI requiring police attendance?

Sources of RTI data

- Mortality data (from death records)
- Coroners data (where investigations take place)
- Hospital in-patient records
- Trauma registries/sentinel surveillance
- Emergency department data/ambulance data
- Police traffic crash reports
- Specially designed population surveys
- Insurance company data

Challenges with existing sources

- **No one source provides all the data needed**
- **Hospital data may not:**
  - Code to sufficient degree of detail to understand context of RTI
  - Pick up all RTI cases eg deaths that don't go to hospital, cases treated elsewhere
- **Hospital data requires investment in infrastructure and appropriate coding**

- **Police data:**
  - Good detail on context of crash
  - Under-reports injury and crash data

Record linkage- Injury research

- Record linkage is the joining of information from two or more records that are considered to relate to a common entity.

- The first applications of record linkage to public health research goes back to the 1960's, mainly in the area of Cancer Research

- Application of record linkage techniques to injury prevention research has only been a fairly recent development

Why link injury-related datasets ?

Dataset	Hospital separations	Emergency department presentations	Death records	Police crashes data	Insurance claims
Injury event characteristics					
Type/circumstance	?	N	?	Y	?
Date/time of injury	N	N	N	Y	Y
Place of occurrence	?	N	?	Y	?
Geographic location	N	N	N	Y	N
Context of activity while injured	?	N	?	N	Y
Environmental factors at time of injury	N	N	N	Y	N
Personal and demographic data					
Age/gender	Y	Y	Y	Y	Y
Area of residence	Y	?	Y	Y	Y
Ethnicity	?	?	?	N	N
Socioeconomic status	I	N	I	N	I
Outcomes of injury					
Nature of injury	Y	?	Y	N	Y
Injury body region	Y	?	Y	N	Y
Severity of injury	I	?	-	N	?
Costs of injury	I	?	I	N	I

Surveillance and data collection for SEARO

- **Hospital based surveillance systems growing in region**
  - E.g. Indonesia 2006 web based integrated hospital based system, data collected from multiple hospitals and sentinel district hospitals on type of crash, outcome, aid given, severity
  - E.g. Sri Lanka piloting system in 3 hospitals, pre-designed data analysis tables in order to readily produce appropriate data
- **If data systems not adequate or too costly, may conduct special surveys for necessary surveillance, or collect extra data**
  - E.g. Vietnam household injury study
  - E.g. Observational surveys e.g. on helmet or restraint use
    - Consider sampling frame; must be repeatable to allow comparison with repeat surveys

Data collection

- Basic injury surveillance systems may not provide sufficient detail for RTI
- CORE DATA SET
  - Basic demographics
  - External cause of injury (coded to ICD 10)
    - May not get sufficient detail on RTI
  - Mortality/morbidity
- ADDITIONAL DATA
  - Severity (length of stay)
  - More detail on external cause
  - Treatment?
  - Disability

APPENDIX A : LEVEL I INJURY SURVEILLANCE INSTRUMENT

Registration or Identification #

Age: _ _ yrs.

Sex: 1. ☐ Male   2. ☐ Female   9. ☐ Unknown

Place: *Where were you when you were injured?*
1. ☐ Home   2. ☐ School   3. ☐ Street/Highway
8. ☐ Other ....   9. ☐ Unknown

Activity: *What were you doing when you were injured?*
1. ☐ Work   2. ☐ Education 3. ☐ Sports   4. ☐ Travelling
8. ☐ Other ....   9. ☐ Unknown

Mechanism: *How were you hurt? Or how was the injury inflicted?*
1. ☐ Traffic Injury   2. ☐ Sexual Assault   3.☐ Fall
4 .☐ Other Blunt Force   5. ☐ Stab/Cut   6.☐ Gun Shot
7. ☐ Fire, heat   8. ☐ Choking/hanging   9. ☐ Drowning
10. ☐ Poisoning   98. ☐ Other ....
99. ☐ Unknown

Intent: 1. ☐ Unintentional   2. ☐ Self-Harm 3. ☐ Assault
          8. ☐ Other ....   9. ☐ Unknown

Nature of Injury:
1. ☐ Fracture   2. ☐ Sprain/strain   3. ☐ Cut, bite, open wound
4. ☐ Bruise   5. ☐ Burn   6. ☐ Concussion
7. ☐ Organ System Injury   8. ☐ Other ....
9. ☐ Unknown

Additional information

- **Type of road user**
  - Pedestrian, car occupant
- **Role of road user**
  - Driver, passenger
- **Counterpart**
  - If the crash involved another party – with what did they collide?
- **Alcohol (drug) involvement**
- **Use of protective devices (eg helmet)**
- **Outcome - disability**

Challenges in establishing a hospital based surveillance system

- **Lack of trained personnel**
  - Build data base/analyse data
  - Collecting and coding data appropriately to ICD 10 external cause codes
  - Data entry
  - Generating surveillance reports
  - Quality control – training, accountability
- **Funding for data collection**
  - Form needed for every admission
  - Can be part of routine data collection?
  - Electronic data systems; require back-up; software upgrades

Summary

- **Collect minimum data sets; maximise analysis and dissemination**
- **Build in feasible, sustainable system – consider cost!**
- **For RTI – need to collect data from multiple sources and compare; data linkage where possible**
- **Supplement routinely collected data with**
  - Special household surveys on risk factors
  - Regular observational surveys
  - Sentinel site data collections