The Epidemiological Ladder

When choosing a study design, the signs are not always clear regarding which direction to go. Each option has strengths and weaknesses to be considered. Understanding the main differences between the designs is a first step in the right direction. The CRICH Survey Research Unit has developed a new reference table to help you understand these differences: The Epidemiological Ladder.

<table>
<thead>
<tr>
<th>DESIGN CHARACTERISTICS</th>
<th>STUDY DESIGNS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DESCRIPTIVE EPIDEMIOLOGY</td>
</tr>
<tr>
<td></td>
<td>OBSERVATIONAL</td>
</tr>
<tr>
<td></td>
<td>CASE REPORT/SERIES</td>
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<tr>
<td>Describes outcomes and/or exposures</td>
<td>Yes</td>
</tr>
<tr>
<td>Tests a hypothesis</td>
<td>No</td>
</tr>
<tr>
<td>Samples by outcome</td>
<td>n/a</td>
</tr>
<tr>
<td>Samples by or assigns to exposure</td>
<td>n/a</td>
</tr>
<tr>
<td>Follows the development of new outcomes</td>
<td>n/a</td>
</tr>
<tr>
<td>Randomly assigns the exposure</td>
<td>n/a</td>
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</tbody>
</table>

**Alternative study names**

- n/a
- Prevalence study, Disease frequency survey
- Retrospective design; backwards design; case referent; case comparison
- Historical prospective; non concurrent cohort; non concurrent prospective, retrospective chart review
- Follow-up study; prospective study; longitudinal study; concurrent; incident; panel
- Experimental cohort; randomized comparative trial; intervention trials

**Description**

- Describes the characteristics of a case or a series of outcomes and/or exposures.
- Investigates the relationship between outcome and exposure at a particular point in time.
- Compares a group with known outcome and suitable group without outcome to understand the relationship between this outcome and past/current exposure.
- Collects/reviews retrospective data to compare a group with known exposure and suitable unexposed group to understand the relationship between exposure and outcome.
- Prospectively follows a group with known exposure and suitable unexposed group to investigate the relationship between exposure and outcome.
- Randomly allocates participants/units into exposed and unexposed groups and prospectively follows these groups to investigate the relationship between exposure and outcome.

**Main design variations**

- n/a
- Ecological design - the unit of analysis, instead of individuals, is the entire population or groups of people
- Cross over design - subjects serve as their own control and contribute data to both exposed and unexposed groups
Examples from studies managed by the CRICH Survey Research Unit

Neighbourhood Effects on Health and Well-being (NEHW)
Principal investigators: Patricia O’Campo and Blair Wheaton
A cross sectional design where study participants were randomly selected based on census tracts. Exposure and outcome measures were collected via in-person structured interviews at a single point in time. For more information about this project visit: www.stmichaelshospital.com/crich/projects/nehw

Toronto Social Housing and Health
Principal investigator: James Dunn
A prospective cohort design where participants receiving a housing intervention (exposure) and suitable unexposed participants are being followed to compare changes in outcomes over time. For more information about this project visit: www.stmichaelshospital.com/crich/projects/socialhousinghealth

A Randomized Controlled Trial of Housing First for Homeless People with Mental Health Illness: Long-Term Outcomes (At Home Study)
Principal investigators: Stephen Hwang, Patricia O’Campo, Vicky Stergiopoulos
A randomized controlled trial where participants were randomly assigned into a housing intervention treatment group or a treatment as usual group. Both groups were interviewed at baseline and at fixed intervals after the intervention. This project is on-going. For more information about this project visit: www.stmichaelshospital.com/crich/projects/at-home

Remember: It is also important to take into consideration non-methodological aspects, such as: ethical and privacy considerations, budget and time constraints, data collection and analysis capacity, and the available sampling frame, among others.

The Epidemiological Ladder is a work in progress. If you have any comments or suggestions please email SRU@smh.ca.

CRICH Survey Research Unit – Providing high quality and efficient research services to the health and social sciences research community

We can help you determine the types of services that are right for your project. Contact us for data collection options, rates and availability.

Contact information:
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