Causation in Medicine

Conference on Conceptual Revolutions: From Cognitive Sciences to Medicine
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Two approaches to causation
Milestones: Viral oncogenesis

- Marek's Disease
- Skin Papilloma
- Rous Sarcoma
- Shope Papillomavirus
- Murine Mammary Tumour
- Lucké Renal Adenocarcinoma
- Murine Leukaemia
- Bovine Papillomavirus
- Burkitt's Lymphoma
- SV40
- Adenovirus 7, 12, 18, 31
Mechanism schema for cancer causation
Mechanism schema for viral infections

- Appropriate host factors
- Exposure to virus
- Viral infection
- Symptoms
- Pathology
Burkitt’s lymphoma
Burkitt’s lymphoma and Epstein-Barr virus
Burkitt’s lymphoma distribution
Burkitt’s lymphoma
Cervical cancer risk factors
[Elliot, 1964]

- **Risk factors**
  - Low socioeconomic status
  - Marriage
  - Sexual intercourse with multiple sexual partners
  - Employment as prostitutes
  - Infection with syphilis

- **Protective factors**
  - Jewish or Muslim faith
  - Sexual abstinence
  - Circumcision of male partner
  - Cleanliness of male partner
  - Use of barrier contraception
Evidence for herpes simplex virus as cause of cervical cancer
[Alexander, 1973: 1486]

1. HSV is a commensal organism
2. HSV is transmitted venerally
3. HSV is compatible with known risk factors, including:
   1. First coitus at early age
   2. Multiple sexual partners or promiscuity
   3. Low socioeconomic status
4. Herpes viruses are implicated in similar disease states
5. HSV is recoverable from some tumour cells
Getting to causation...
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- Development of a conjoint research programme
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- Trigger: search for a specific aetiology and consequent interpretive framework
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- Recursive process:
  - laboratory work guides epidemiology
  - epidemiology guides laboratory work
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- Integration of laboratory and epidemiological investigation
- Recursive process:
  - laboratory work guides epidemiology
  - epidemiology guides laboratory work
- Production of interdependent mechanistic and statistical evidence
  - Russo and Williamson [2007]
Branch-jumping and causation
Branch-jumping and causation

-Metabolic
-Infектив
-Traumatic
-Autoimmune
-Vascular
-Inflammatory
-Degenerative
-Idiopathic

Acquired Disease

Congenital
Branch-jumping and causation
Branch-jumping and causation

- Neoplastic
- Infective
- Metabolic
- Traumatic
- Autoimmune
- Vascular
- Inflammatory
- Degenerative
- Idiopathic

Acquired

Congenital

Disease
Bibliography: Philosophy

Bibliography: Causation in medicine

Bibliography: Cervical cancer

Bibliography: Burkitt’s lymphoma