What is the need for semantic interoperability?

• Automation of systems that deal with health information requires clinical data that:
  – is **recorded** at the appropriate level of detail
    • not forced to be either too general or too specific
  – is **consistent** over time and across boundaries
  – can be **transmitted** without loss of meaning
  – can be **aggregated** at more general levels, and along multiple different perspectives
  – can be **interpreted** by automated systems

• Natural language does not meet these requirements
Semantic Interoperability: Developing a Research Agenda

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Expected benefits of semantic interoperability

- **Reduction of errors**
  - Elimination of errors of omission via **reminders**
  - Elimination of errors of commission via **alerts**

- **Management of costs**
  - Elimination of redundant testing and investigation

- **Monitoring and responding to trends & problems in the health of populations**

- **Expanding knowledge of diseases, treatments and outcomes**
A Few Assumptions

• There will be no single research study that will convince policy makers
  – Skeptics will be able to resist for the foreseeable future
  – Research is usually used post-hoc to justify a course of action that is being taken for other reasons

• Some things are going to happen anyway
  – NPfIT
  – KP

• Just do it. Build it, test it, revise it, continue.
  – If you aren’t criticized both by the researchers as being too applied, and by the application developers as being too theoretical, you’re in the wrong space.
High Priority Research Issues:

- Interface between concept model & information model
  - Specifically interface between SNOMED & HL7 v3
  - Proposed work item with HL7 vocab
- Context
- Negation
- Practical Composition ("post-coordination")
High Priority Research Issues

• The interface between “data elements” and ontological expressions
• I.e. how can we formalize relationships between
  – Single entity representation (typified by SNOMED)
    • “malignant pleural fluid mesothelial cells”
  – Question-answer (data field – value) representation
    (typified by LOINC question plus a coded value)
    • Location of malignant mesothelial cells = pleural fluid
    • Type of cells in pleural fluid = malignant mesothelial
    • Pleural fluid finding = malignant mesothelial cells
    • Pleural fluid mesothelial cells status = malignant
    • Etc.
Percentage of SNOMED CT concept codes that are “fully defined”

Eventually should reach ~70% or more of disorders, findings & procedures