Applying Ontological Realism to Medically Unexplained Syndromes

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Big Question: Why Realist?
Hand-wavy Definition of Realist Ontology

The difference between concept-driven and realist ontologies is in the realist distinction between the types of entities being represented.

- **L1**
  - First Order Entities (Real)

- **L2**
  - Representations (Imaginary)

Particulars: Things

Ideas
What this means to me
3-yo children know that physical objects can be seen and touched but mental images of objects cannot. (Carrick & Quas)

Higher verbal intelligence = better fantasy-reality distinction
Formal Definitions

**Level L1**: the level of reality (for example, in the medical domain, the reality of pains, wounds, bacteria, on the side of the patient

**Level L2**: the level of cognitive representations of this reality, for example as embodied in observations and interpretations, as well as in beliefs, desires and other mental acts and states on the part of patients, clinicians, and others;

**Level L3**: the level of publicly accessible concretizations of L2 cognitive representations in information artifacts of various sorts, of which ontologies, terminologies and Electronic Health Records are examples, as also are categorical systems such as the DSM.

Slide barrowed from Barry Smith
Question:
How can we better understand Medically Unexplained Syndromes (MUS) by representing them in a realist ontology?
MUS Definitions

• **MU Symptom**: symptom that after investigation, cannot be explained by an underlying organic problem.

• **MU Syndrome**: constellations of medically unexplained symptoms that co-occur in consistent patterns.
Problems with MUS

- **Pathophysiological basis** (brain, body, both, neither)
- **Unstable Diagnostic criteria**
- **Diagnosis based on symptom severity**
Considerations for Solution

- **MUS** ontology should be an application ontology
- **MUS** cannot be representational unit
  - Defined Classes, i.e. groupings of particulars
- **OGMS Syndrome** and **Sign** on the **patient** side are risky
- **OGMS Clinical Picture** and **Diagnosis** on the **provider** side, almost but not quite
Foundational Units

**Clinical Representation** ≡
A (Information Artifact Ontology - IAO) **Representational Artifact** of a **Phenotype** that is inferred from the combination of laboratory, image and clinical findings of a given patient.
Foundational Units

Defined Class

**Unexplained Clinical Representation** =

A **Clinical Representation** that is used as input for an interpretive process that **does not** lead to a **Diagnosis**.
Foundational Units

**Diagnosis of MUS ≡**

A (IAO) **Representation** of the conclusion of an interpretive process that has as an input an **Unexplained Clinical Representation** of a given patient and as output an assertion to the effect that no **(OGMS) Diagnosis** has been established.
Better Understanding of MUS

- Highlights diagnosis of exclusion
- Standard assessment instruments and diagnostic criteria
- Ontology for keeping track of criteria
- Extend to other “syndromic” diagnoses
End