Key points

1. The model should be comprehensible. The introduction should orient the reader to the model, not repeat information in the model or introduce information not in the model. It should be short.
   1. What, of the material I suggest we cut, is important and needs to be in the model?
2. The sciatica passage: that’s another use case. Let’s have one use case. We can introduce the use case with a simplified view, if absolutely necessary, but we don’t want to lengthen the document without a reason to do so.
3. Clinical & Engineering are one. That’s the point of the “What’s a DAM” excursus.
   1. I’ve boiled all those bullets down to what I see as significant: what makes something a concern, and significant implications.

# Introduction

Healthcare delivery is becoming more complex. Patients, especially those with complex health issues, are treated by multi-disciplinary teams of providers across care settings. Institutions may specialize in one clinical area or super-specialty care. Patients with a history of multiple complex health issues provide a care coordination challenge across institutions. Providers need a robust mechanism to disambiguate clinical findings, keep track of how comorbidities relate to and affect one another, and monitor the impact of different interventions on the progress of the patient’s various conditions. Other persons, including patients, also need a way to communicate to the care team. The Health Concern Domain Analysis Model is intended to provide a means to assist in care coordination considering the perspectives (concerns) of different persons and organizations.

An appendix outlines how the Health Concern concept is related to C-CDA Release 2.1, where templates are defined about the health concern, problem concern, and reaction concern concepts. as well as the ISO/DIS 13940 (Systems of Concepts to support continuity of care) to facilitate harmonization of concepts between projects.

# The Domain Analysis Model Artifact

A Domain Analysis Model (DAM) is a Unified Modeling Language (UML) representation of a “domain,” or area of business requirements. It is a requirements artifact—also known as a “problem domain,” “conceptual” or “business” artifact. It is designed to articulate clearly the needs of the business community as that community understands them. A DAM informs the reader about the domain information, but it doesn’t tell you how to represent it in an information system.

In the words of the *HL7 Development Framework* (HDF), “During requirements documentation the problem domain is defined, a model of the domain (or problem space) is produced as the DAM consisting of static and dynamic model artifacts. Domain, in this case, refers to the problem space for the requirements.” The critical distinction is that the DAM does not specify patterns for representing the data. It does not conform to the HL7 Reference Information Model (RIM), or to openEHR, or to any other logical pattern, as it must represent the problem domain with sufficient clarity to support development in any of those patterns.

The HDF clarifies: “A DAM defines what needs to be done, not how to do it. It is important to separate the description of requirements from the design of the solution. Prematurely including technical and implementation details will compromise the clarity of the original problem and will result in standards that fall short of the business needs. The DAM is [*subsequently*] used to create standard specifications by harmonizing it with HL7 references including the RIM, structural vocabulary, and application roles.”

The DAM contains of both a dynamic part—with definitions for actors and the use cases they participate in—and a static part—illustrating the structure of the concepts used in those use cases. The use cases are abstracted from a set of concrete scenarios identified by domain experts.

# Requirements

These are the key requirements the Health Concern is designed to support:

1. **Provide a way to indicate which things are of concern**.   
   The Health Concern concept allows people to indicate which facts are actually of concern (e.g., a “Problem List” for physicians) and should be evident to care providers and other care team members.
2. **Support different persons’ and roles’ perspectives**.  
   Different users will have different needs and expectations regarding what is actually of concern.
3. **Maintain a traceable record of a concern, for understanding, as the concern evolves.** As providers investigate health issues, their understanding of the underlying problem often changes. However, it is sometimes important to be able to understand that today’s diagnosis is the same problem that initially presented as something else--pneumonia as the flu, or gastritis as chest pain. This ability is especially important when reconciling data across organizations.

**Associate events with concerns in order to provide a consolidated view of a concern.** The ability to assign specific data to a concern will allow a user to see the information associated with a concern without having to sort through extraneous data. Some systems may be able to perform these assignments by rule (e.g., observations ordered in the context of caring for a particular concern), but the ability to assert a relationship is fundamental.

**Characteristics of a Health Concern**

1. A health concern is a health-related matter that is of interest, importance or worry to someone whether it be the patient, a member of the patient's family, or a healthcare provider.
2. Deciding that something is a health concern is volitional and intentional. It represents the determination by an individual that a specific health condition, or issue, is of interest, important to document, and may require monitoring and intervention.
3. Health concerns may represent variations from a desired health status or a condition or situation that place the patient at risk for an undesirable health status, and thus may need management or attention. A pregnancy is an example of a condition which may or may not be desired in and of itself, but at minimum requires management because it places special risks on the patient and fetus that could create an undesirable outcome if not properly managed. Health concerns are not always biological in nature, social factors, family dynamics or relationships (e.g., loss of family members, domestic violence), economic stress, risks, etc., may be identified as health concerns.

We also observe some implications of this concept.

1. Health concerns can be created by different persons in different systems without knowing about each other. Therefore, the ability to aggregate and reconcile concerns is desirable, although the concerns of one person may differ in relevance, granularity, or certainty compared to those of another. Ownership of a health concern is often a policy matter within an institution.
2. It is possible to generate different kinds of lists containing the subset of health concerns that meet certain criteria--an allergy list, for instance, or a particular provider’s problem list.
3. We distinguish between the Health Concern and its constituent parts. The parts will include, at least, one event that is the identifying event (e.g., a diagnosis). It may include subsequent identifying events, if the understanding of the concern evolves. And it may include other events of interest, in order to support requirement 3, “Associate events with concerns in order to provide a consolidated view of a concern.” Note that this means that a diagnosis may be the identifying event for a concern, but it is not the concern itself. The concern persists and may change over time, but the diagnosis is a record of an assertion at a point in time.