

Developing an E Cigarette Ontology



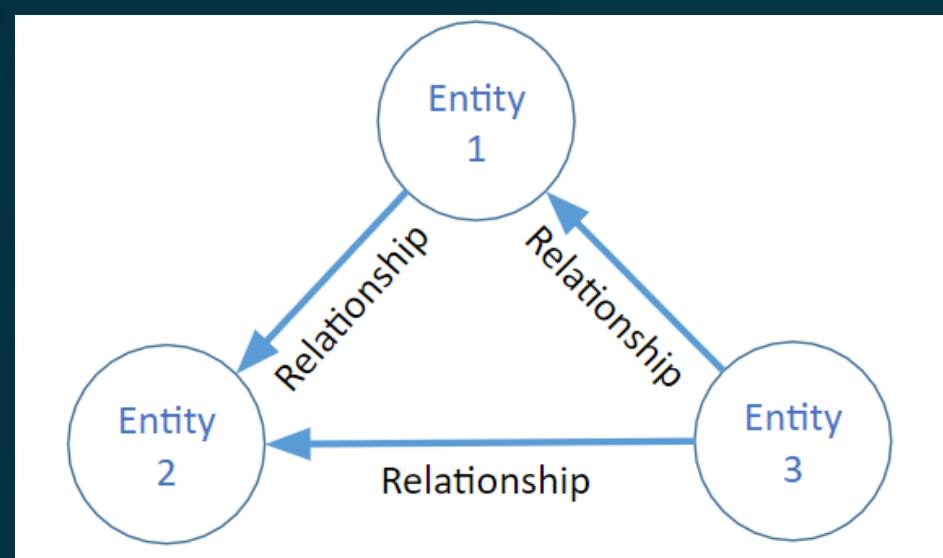
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BACKGROUND

The evidence base for e cigarette research is growing rapidly. As it grows it is important to channel resources into areas that will be most productive and address key unanswered questions. It is equally important that the research should be of high quality, interpreted accurately, using consistent language and linked with prior research findings. Poor quality research studies and misinterpretation of findings can fuel media misreporting, which has led to confusion and, in some jurisdictions, policies that are at odds with the emerging evidence base.

What is an Ontology?

Formal 'ontologies' are 'structured computable representations of the entities in a given domain and the relations between them'.



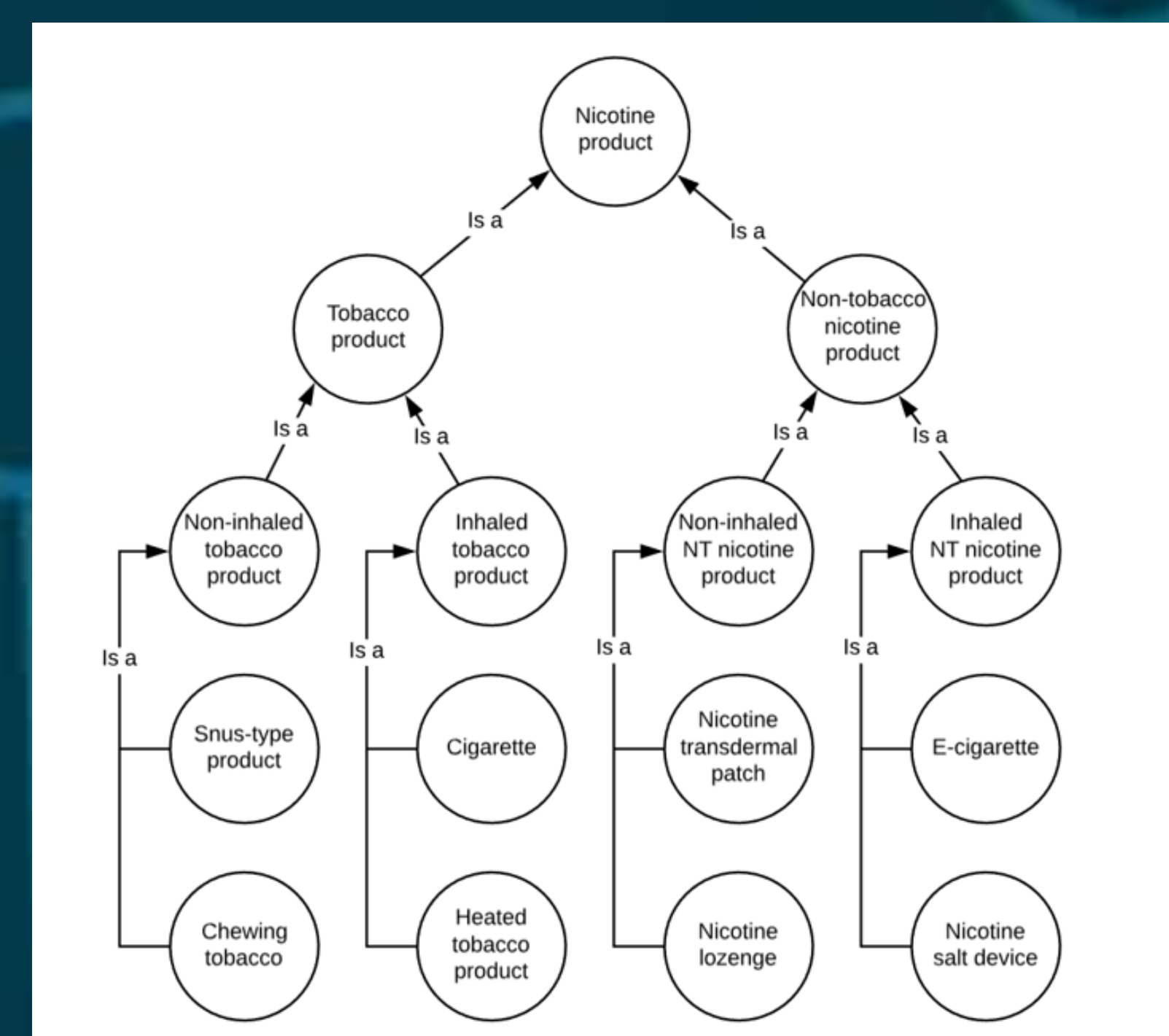
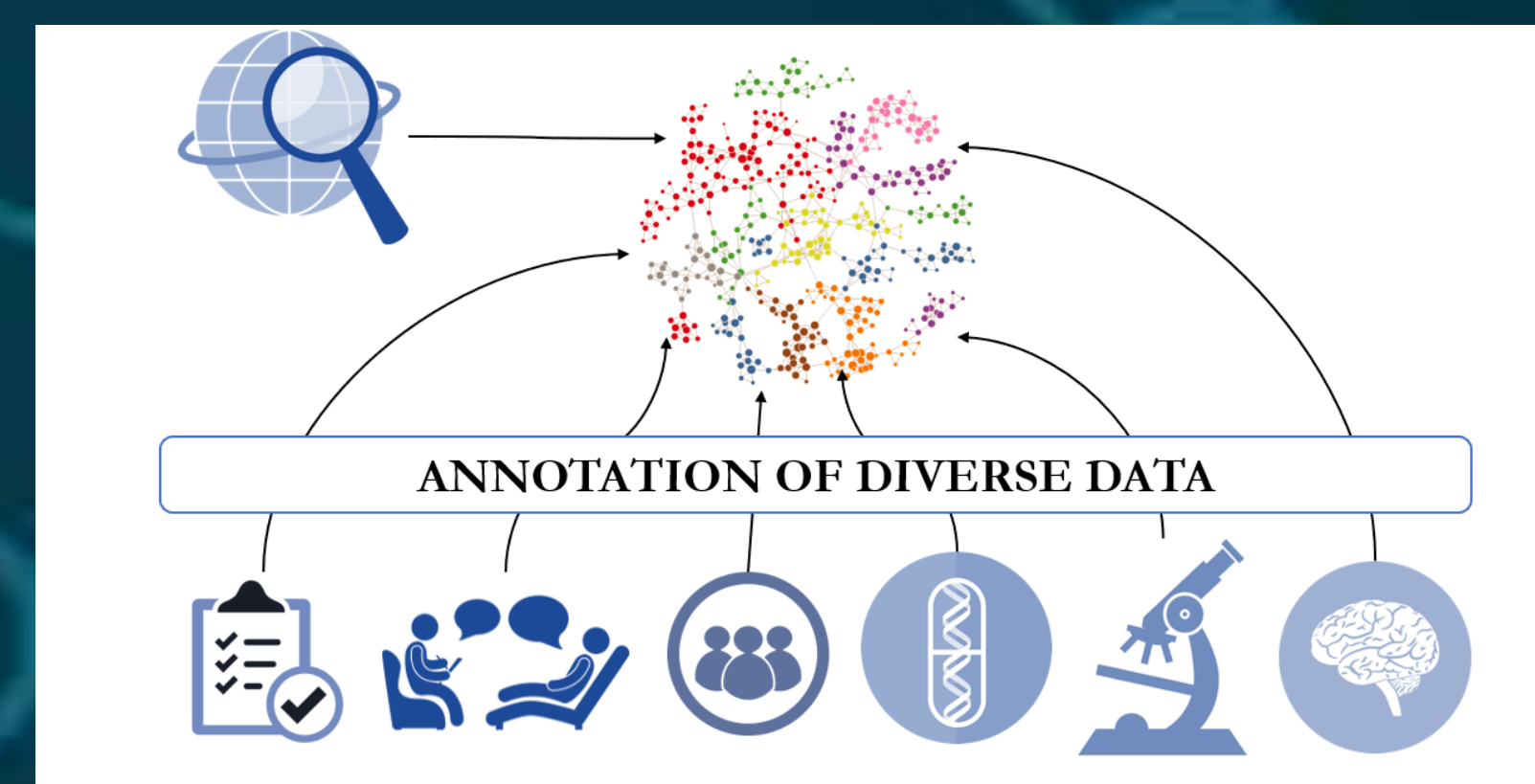
Each entity is assigned a unique identifier, an unambiguous primary label, and a clear, rigorous definition.

Entities are arranged hierarchically in a taxonomy, and may be further interrelated with other (non-hierarchical) relations, which in turn are clearly defined.

This provides a basis for identifying gaps in knowledge, identifying contradictions and inconsistencies, creating models, making inferences and underpinning consistent and transparent methods of reporting. Their use has transformed other areas of study such as biology (Gene ontology, Ashburner et al, 2000) and they are being increasingly used in medicine and public health.

An 'e-cigarette ontology', lying within a broader addiction ontology (West et al., 2019), should help to 'clean up' the science and create a scientific environment conducive to clearer thinking and consistent use of language and terminology, with the aim of optimising output and minimising poor reporting and unjustified conclusions. The end product should be a formal illustration of key entities within e-cigarette research and how they relate to each other.

PROCESS



Example ontological structure for illustration purposes

Initial webinar hosted by CRUK
Introducing the concept

Ontology workshop
including presentations from key experts in the field to propose entities

Transcription of entities by core team

Definitions of entities developed

Consensus forming using Delphi methodology with input from subject experts and experts by experience

Agreement of key entities and relationships

Hosting of ontology as open access resource for all

REFERENCES

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- Ashburner, M., Ball, C. A., Blake, J. A., Botstein, D., Butler, H., Cherry, J. M., ... & Harris, M. A. (2000). Gene ontology: tool for the unification of biology. *Nature genetics*, 25(1), 25.
- West, R., Marsden, J., & Hastings, J. (2019). Addiction Theories and Constructs: a new series. *Addiction*.
- COI statement: No conflicts of interest to declare.

CONCLUSIONS

- The E cigarette ontology (ECigO) will define key entities within the research field, with definitions agreed based on evidence and expert consensus
- ECigO will form part of a wider addiction ontology
- ECigO will be open access
- Ontologies are a 'live' point of reference, updatable in response to new research developments
- Entities and relationships within ECigO will be fully searchable
- Ontological structure can drive scientific understanding and underpin research within the e cigarette field of study