Causal pathway models can be formalized as computable knowledge for **tailoring clinical feedback messages**

Toward computable knowledge about clinical performance feedback messages

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Background

Healthcare organizations have tremendous opportunities to use their data to improve care quality and outcomes. However, an epidemic of provider dissatisfaction with the electronic environment suggests that communication about clinical data is frequently inappropriate[1]. Computable knowledge about performance feedback interventions could enable improved communication via automated tailoring of feedback messages.

Objective

To develop a conceptual model for computable knowledge about performance feedback messages for clinical quality dashboards and performance feedback reports.

Methods

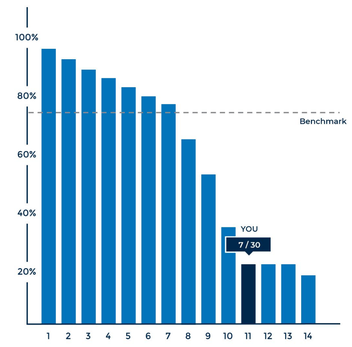
We iteratively a) conducted theory-based content analysis of clinical performance summaries, b) held team discussion and reflection and c) developed ontologies using Basic Formal Ontology[2].

Results

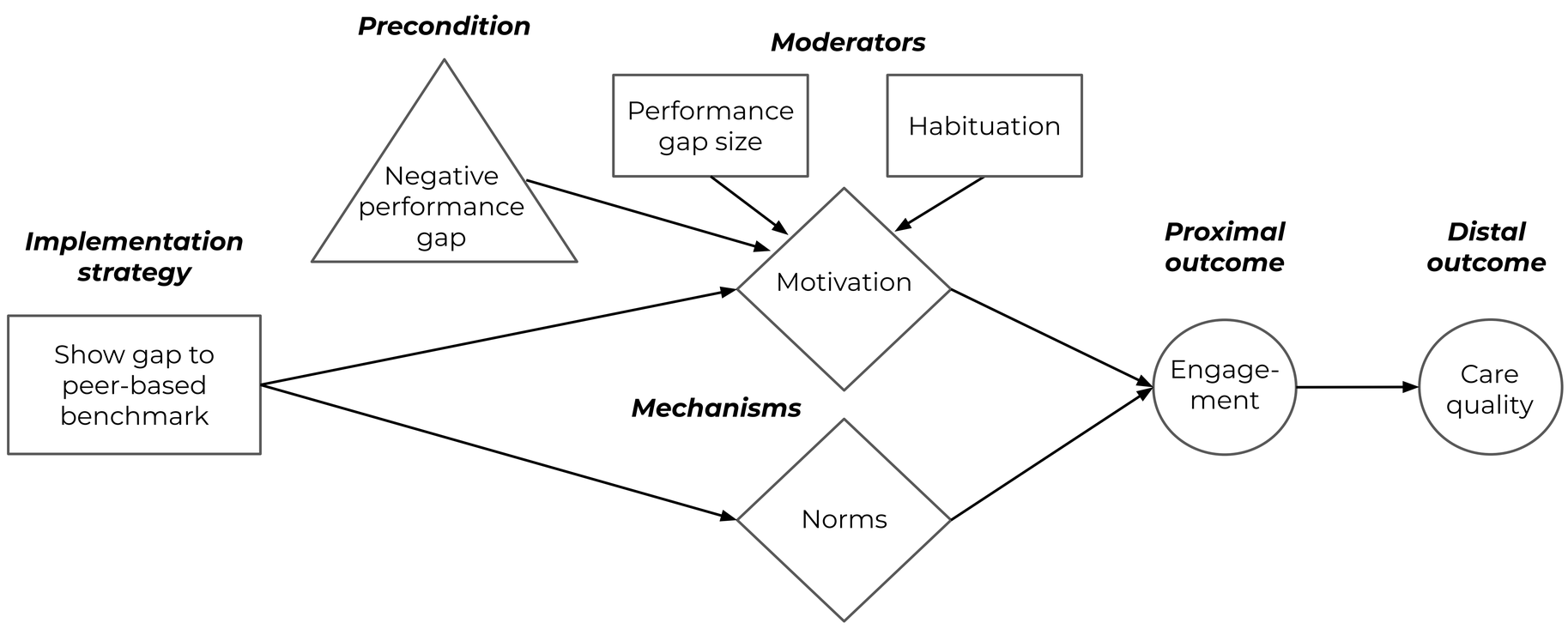
We developed a model with three types of performance feedback knowledge: information content, visual elements, and perceived information. Each modality can represent information about four types of referents: Measures, ascribees, performance, and time intervals. Causal pathway models[3] can link characteristics of referents with knowledge about mechanisms[4] through which feedback messages influence clinical practice. We developed causal pathway and performance summary display application ontologies to support computable specifications for the purpose of message tailoring.

Conclusion

A foundational conceptual model for computable knowledge about clinical performance feedback can use causal pathway models to express theoretical mechanisms of action for feedback interventions.

	Information content	*Visual elements*	*Perceived information*
Example performance feedback intervention	**Performance measure:** Appropriate prescribing of antibiotics **Recipient performance level:** 23% **Peer-based benchmark:** 75% **Negative performance gap:** Present	Key message: "You are not a top performer for appropriate prescribing of antibiotics"		
Upper-level classes (Basic Formal Ontology)	Information content entities	Material information bearers, Qualities	Roles

Example causal pathway for tailored feedback messaging



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