Innovative Approaches to Creating a Public Health System Dynamics Model in Mesa County, CO

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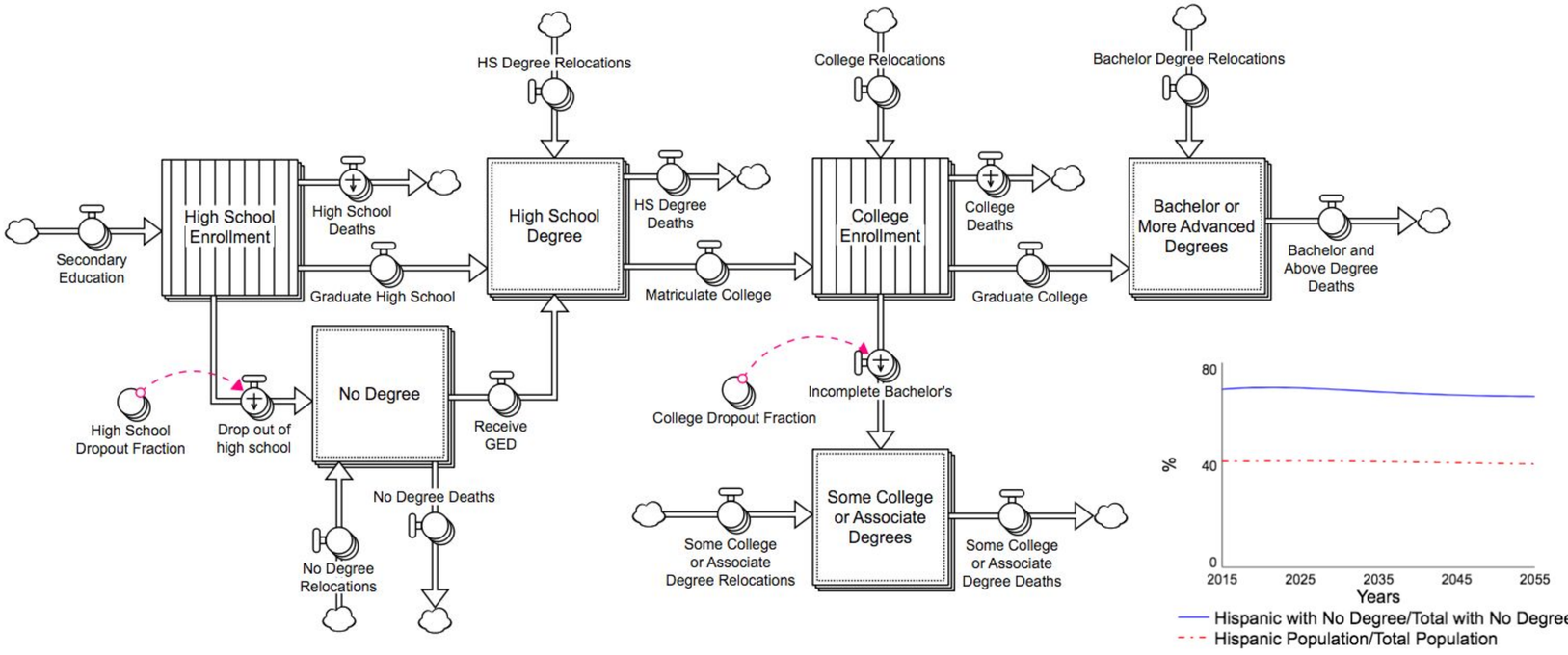
Background

About 80% of the factors affecting health outcomes lay outside of the domain of traditional clinical care.[1] Public Health 3.0, the next level of public health practice, expands the reach of public health practitioners to address upstream factors traditionally outside the scope of health initiatives, such as housing affordability and educational attainment.[2] Public Health 3.0 calls upon local health departments (LHDs) to be the core of this effort by creating impactful change through intentional cross-sectoral collaborations.[2] The Resilience Catalyst (RC) program, designed by the Center for Community Resilience at the George Washington University, is being used to guide Public Health 3.0 implementation in Mesa County, Colorado, one of nine sites. The RC program uses a participatory approach to identify an adversity focus area, the systems associated with it, and determine an implementation plan for working with community partners. Since health is an outcome of complex combination of systems, a key component to the RC program is the creation of a local system dynamics model (SDM) to highlight interaction between factors affecting human health.[3] The SDM is used to inform strategies for community action and policy change.

Methods

- Conducted key informant interviews, theory of change sessions, group model building, and data analysis
- Developed causal loop diagram by determining qualitative variable relationships from community data
- Designed stock and flow structures from community data and literature reviews
- Validated structures by comparing model data to historical data
- Iterated the model with additional community data and feedback

Results



Conclusions

Discussion

- Modeling process was even more iterative than expected
- Matching model structure to data availability is helpful
- Use of conveyor stocks is useful for processes with a fixed amount of time, but misses certain populations
- Inclusion of arrayed ethnicity data adds value by highlighting disparities
- Arrayed modeling creates additional complexities such as missing data on Hispanic/Latino population
- Need to balance complexity with matching reality

Future Directions

- Improved equation sophistication
- Incorporate COVID-19 effects

References

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