Joe Brew (UFID: 0402-8902)
PHC 7000 - Epi Seminar II
HW2: Causality

Homework #2: Causality

Joe Brew

1. Rothman, Chapter 2 (Multicomponent view of causality)

a. Choose an outcome of interest from your own research. Draw a picture that includes 3 or more possible causal factors related to that outcome. Bring 7 copies of the diagram to class.

Drawing on final page.
Outcome: childhood obesity (BMI percentile for age >= 85%)
Possible causal factors:

- Excess of calories consumed (cc) to calories expended (ce): cc > ce
- Premature birth / low birth weight
- not having been breastfed (http://www.ncbi.nlm.nih.gov/pubmed/25595034)

b. Be prepared to discuss many of the definitions in the chapter and the Tables.

Okay.

c. Consider the causal criteria by Bradford Hill - and be prepared to discuss the pros and cons of this method, vs. a component causal model.

Bradford Hill:

1. strength
2. consistency
3. specificity
4. temporality
5. biologic gradient
6. plausibility
7. coherence
8. experimental evidence
9. analogy

Component causal:

- sufficient cause: complete causal mechanism, a minimal set of conditions sufficient for outcome to occur
- component cause: pieces add up
- necessary cause: particular type of component cause - appears in every sufficient cause

My criticism:

- Both approaches ignore both physics and philosophy. Everything is unicausal. Associations are okay. Big data makes it so!

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2. Read the article by Galea on causal thinking in epidemiology. In 2-3 sentences, explain how Galea thinks that modeling techniques used to mimic infectious disease transmission could be used to address non-infectious disease outcomes. State whether you think Galea's goals are realistic.

Galea argues that the hunt for single causes is counterproductive, given recent advances pointing to the multi-causality of just about everything. Since events occur in a system (with interactions, feedback, etc.) simulating and modeling (while carefully controlling certain components) better elucidates the chain of causation than over-simplified diagrams and reductionist approaches. Given the technical tools available to us, and the knowledge we've gained regarding causality, "complex systems dynamic models" are better suited for moving the field forward.

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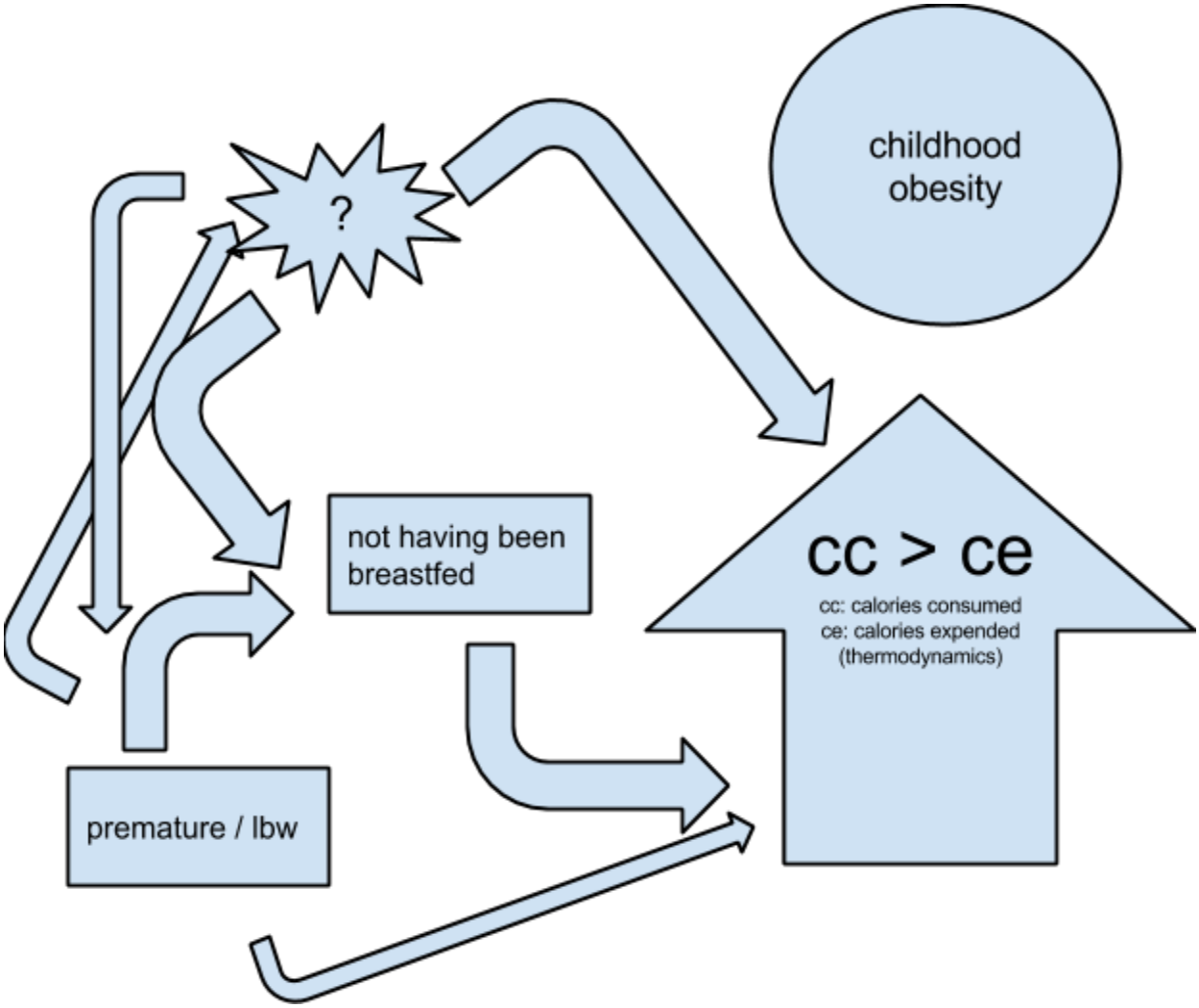
Drawing (question 1)



3 conditions

- Excess of calories consumed (cc) to calories expended (ce): cc > ce
    - necessary cause
    - thermodynamics, simplistic
- Premature birth / low birth weight
- not having been breastfed (http://www.ncbi.nlm.nih.gov/pubmed/25595034)