Simulating Meth Production Networks

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Overview

Network Problems what goes in (a simulation) is what comes out

A Meth Bust "Network" circa 70s Australia

Simulating Production Breaking Bad?

Next Steps Observation Model, Intervention Outcomes, Competition, Adaptation

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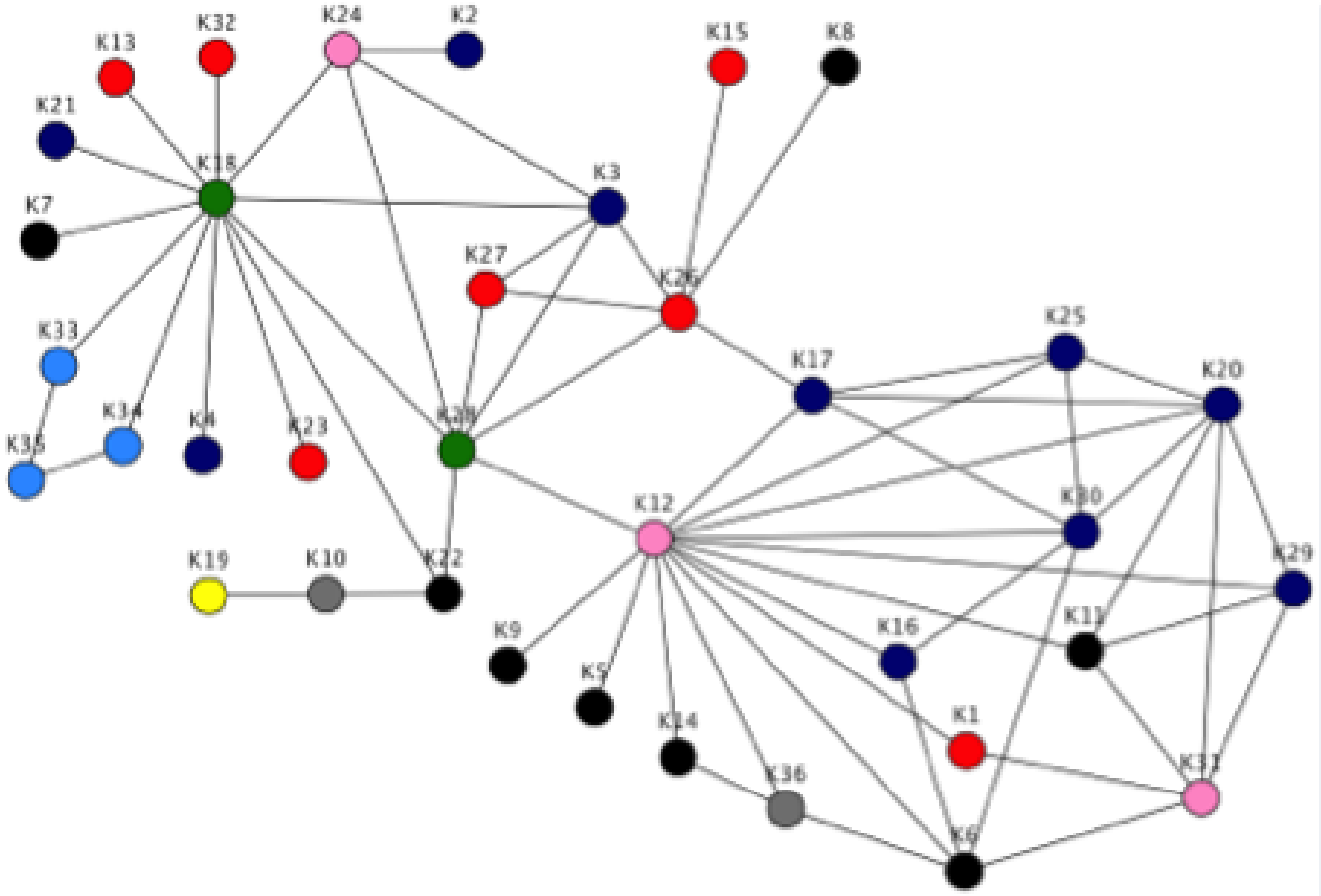
- For "dark" networks - highly questionable

PROSECUTED METH PRODUCTION & DISTRIBUTION GROUP



Adapted from Bright, Hughes & Chalmers (2012)

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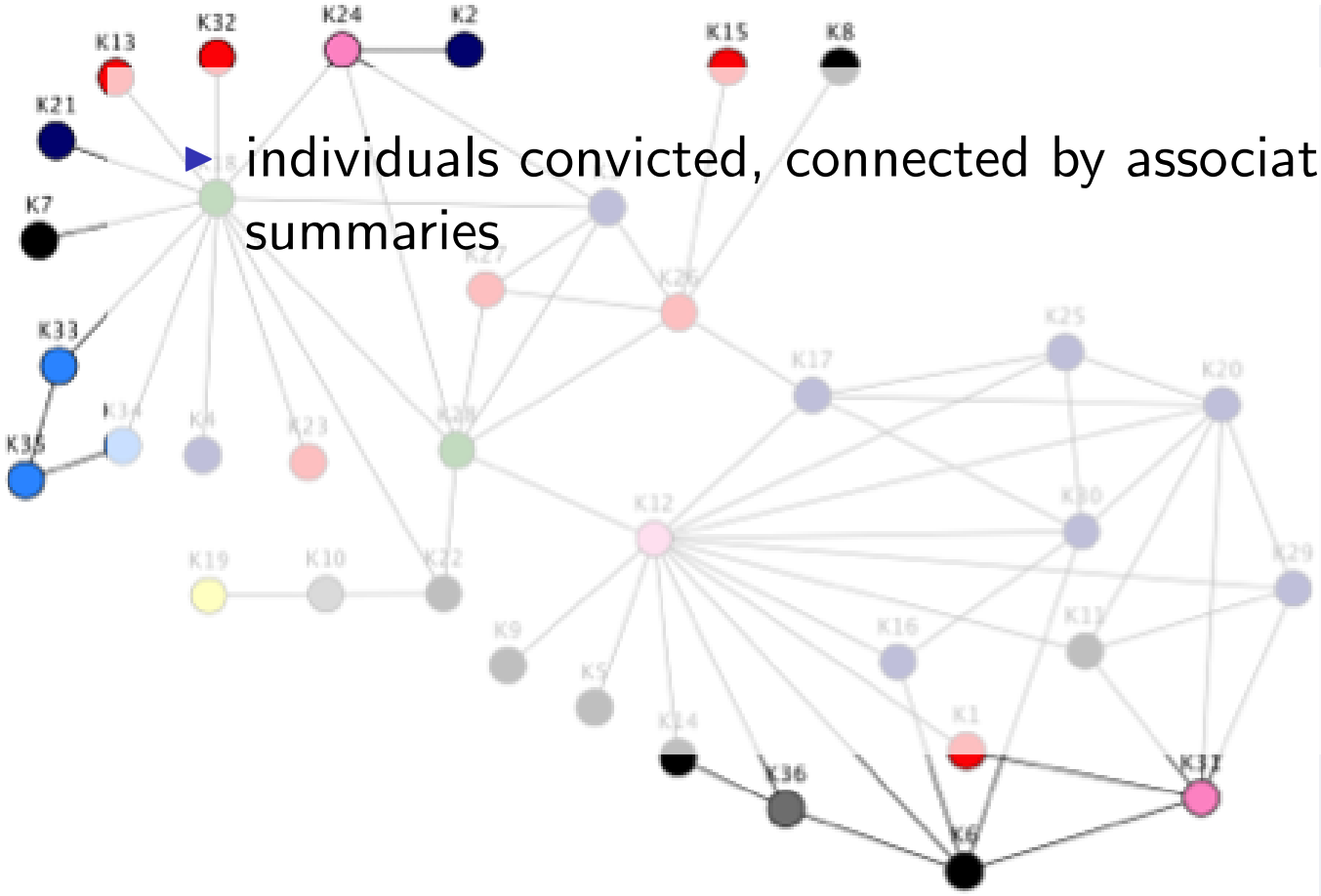

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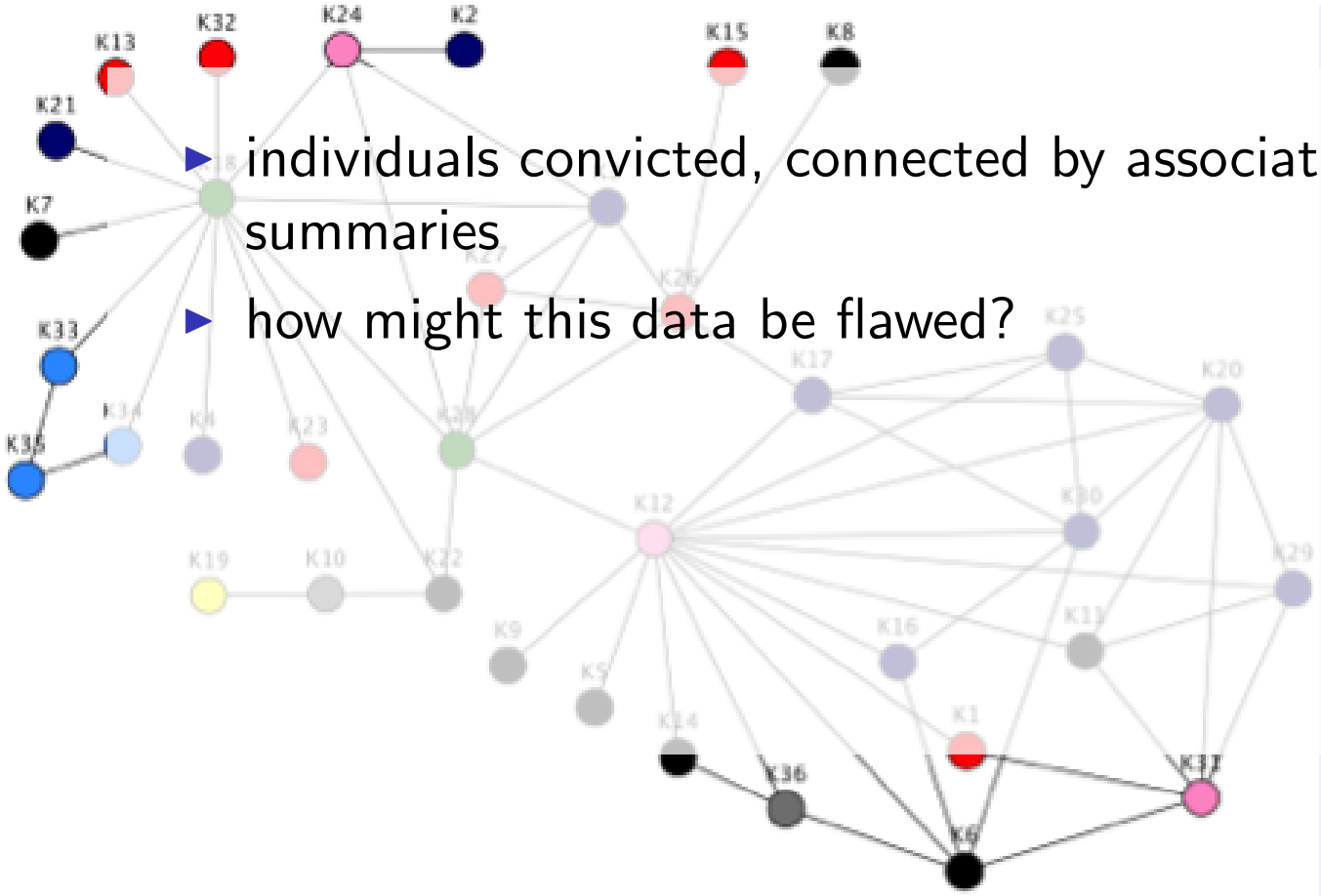

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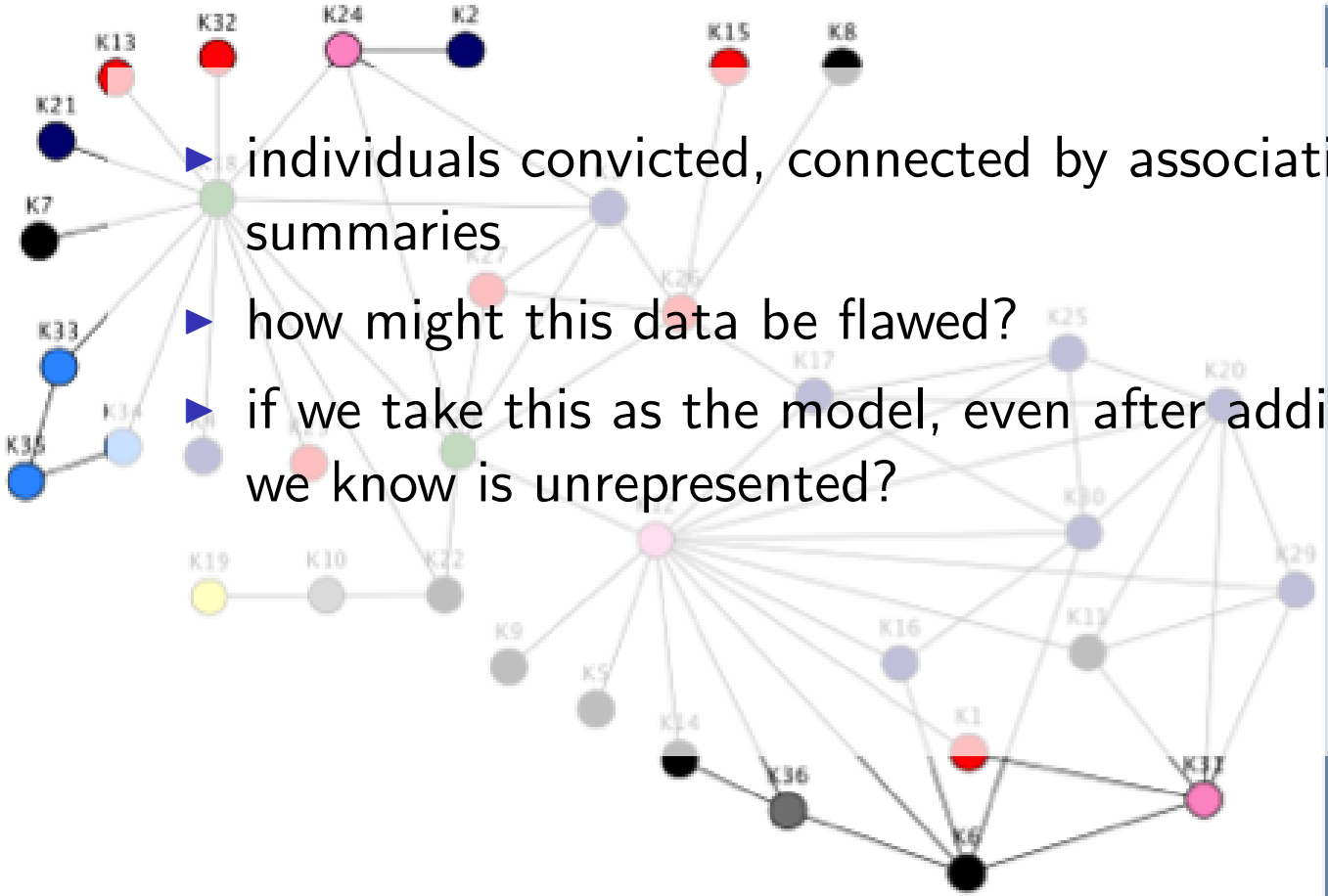

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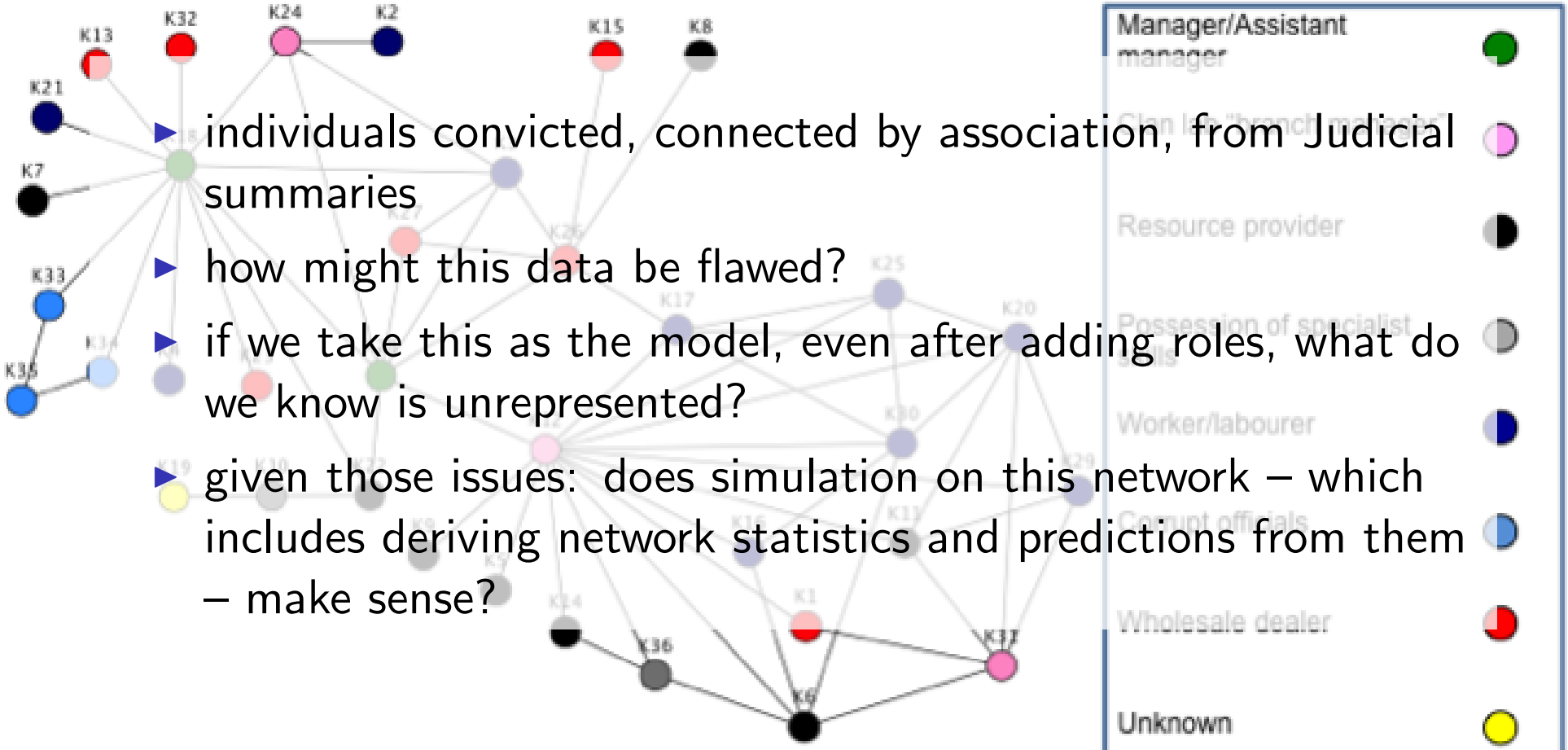

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- how might this data be flawed?
- if we take this as the model, even after adding roles, what do we know is unrepresented?
- given those issues: does simulation on this network – which includes deriving network statistics and predictions from them – make sense?

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- compare measures – pseudoephedrine consumption, methamphetamine production, net profit rates – to available estimates

SIMULATING METH PRODUCTION

Relatively few parts, all written in Scala

`World` meth consumption rate, pseudo cost

`Suppliers`, `Retailers`, `Wholesaler` margins and purchase or delivery efficiencies

`Middleman` margin, efficiency

`Cook` margin, pseudo conversion efficiency

SIMPLE ECONOMIC FORCES ONLY

Agents try to net their margin per iteration. Demand for meth inelastic. No economies of scale.

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PARAMETER ESTIMATES[2][3][4][1]

Use kilograms as reference mass unit, AUS $ as reference price unit

Unit Meth per Unit Pseudo	0.9
Meth Conversion Efficiency	0.5 - 1.0
Meth Consumption	average 10 doses per user per month, 0.0001 units per dose, 20 users per capita
thing	margins and purchase or delivery efficiencies
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STEADY STATE RESULTS

Street Price X per dose vs observed Y per dose

Gang Takehome X per month vs observed Y per month

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PERTURBATIONS

TODO series of background plots

- Increase Pseudo Cost at time T
- Increase Demand at time T
- Increase Margins at time T
- Decrease efficiencies at time T

TODO

Next Steps

ion Model	translate simulate outputs via filter to observations
Dynamics	intra- and intergroup competition, turnover of employees, customers
Outcomes	single gang interventions, evolution of competing gangs

QUESTIONS?

talk and simulation source available at

https://github.com/pearsonca/sunbelt-2014

https://github.com/pearsonca/scala-commsim

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SUPPORTING MATERIAL

Meth Consumption

100 mg per dose; per capita: roughly 10 “regular” users (between weekly and monthly dose), roughly 10 “dependent” users