Risk Factors for Infant Mortality

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Infant Mortality Rates by Race/ethnicity
Maryland and US 2016

- All Groups
- Black NH
- White NH

Maryland
US
Schematic of studies included in the scoping review of risk factors for infant mortality*

Records identified through database searching (N=1282)
- PubMed = 686
- Embase = 596

Records after duplicates removed (N=322)

Titles & abstracts screened

Full-text articles assessed for eligibility (N=64)

N=40 studies included in scoping review

Inclusion criteria applied:
- English language
- 2008-2018
- United States
- Human subjects

Records excluded (N=258)

Full-text articles excluded (N=24)
- Race treated as confounder (N=4)
- Race as exposure (N=2)
- Infant mortality as exposure (N=1)
- Wrong outcome studied (N=2)
- Commentaries (N=6)
- Full text not found (N=3)
- Race-specific results not presented (N=1)
- Risk factors not explored (N=5)

* Inclusion of studies was informed by Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines.
The review was informed by the eco-social model of health.
Conclusions: Individual-level factors

Focus of the literature (2008 – 2018) has been on four of the known causes of infant mortality:

Preterm birth
Low birth weight
Sleep position
Accidents

Other risk factors were also investigated:

Maternal health status: BMI, age, parity; depressive symptoms

Maternal health behaviors: smoking; prenatal care; pregnancy intention

Maternal demographics: education; income; marital status
Conclusions: Individual-level factors

The identified risk factors are equally relevant to white or black non-Hispanic women.

Compared with white Americans, African Americans present with more risks that are often at more advanced stages.

The variable race does not capture the lived experience of African Americans.
Why black women present with more risks than white women?
Beyond individual-level determinants of infant mortality, the literature highlights the importance of structural factors that determine access to health-promoting resources within communities.

Structural determinants of health drive racial-ethnic disparities in infant mortality and not individual-level risk factors.
Maternal & Child Health Outcomes Across Various Baltimore Neighborhoods (2016 Data)

<table>
<thead>
<tr>
<th>Maternal &amp; Child Health Measurement</th>
<th>Cross-country/Cheswalde</th>
<th>Roland Park/Poplar Hill</th>
<th>Downtown/Seton Hill</th>
<th>Clifton-Berea</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of Women receiving prenatal care in 1st Trimester</td>
<td>62.8</td>
<td>73.6</td>
<td>57.4</td>
<td>51.7</td>
</tr>
<tr>
<td>% of Women who reported smoking while pregnant</td>
<td>1.1</td>
<td>1.4</td>
<td>5.8</td>
<td>15.2</td>
</tr>
<tr>
<td>% of live births occurring preterm</td>
<td>5.4</td>
<td>8.1</td>
<td>12.8</td>
<td>14.7</td>
</tr>
<tr>
<td>Teen birth rate (per 1,000 15-19 year old females)</td>
<td>7.1</td>
<td>0</td>
<td>37</td>
<td>61.2</td>
</tr>
</tbody>
</table>
Maternal Risks:
- Health status
- Health behaviors
- Education
- Income
- Age
- Smoking
- Race

Causes:
- Preterm birth
- LBW
- Birth defects
- SIDS
- Pregnancy comp.
- Accidents

Why black women present with more risks than white women?

Structural determinants:
- Income
- Inequality
- Structural racism

Improve access to local health promoting resources:
- Fresh foods & vegetables
- Healthy/affordable housing
- Public transportation
- Neighborhoods safety

Infant Mortality

Maternal Risks:
- Health status
- Health behaviors
- Education
- Income
- Age
- Smoking
- Race
Other considerations

About 40% of women who give birth before 37 weeks gestation present with **no known** risk factors.

Must consider the sensitivity and specificity by which risks can be identified.

Must consider prevalence of risk factors. The vastly higher number of low risk individuals produce nearly as much infant mortality than the much smaller population of high risk individuals.
In the reviewed literature the average prevalence of individual-level medical/behavioral risk factors is \( \sim 12\% \).
Example: Compared with the low risk population, the high risk population has a risk ratio of 4, but this low risk population gives rise to nearly as many cases as the low risk population.
Conclusions
Scoping reviews provide a broad and accurate picture of work during a particular period but do not consider earlier seminal works; they do not include an assessment of methodologic quality of the included studies.

The literature (2008-2018) is focused on individual and interpersonal risk factor; and secondarily on structural and community level factors, there is only sparse literature on organizational variables.

We found no literature on determinants of infant mortality among residents of rural areas.

No literature on interactions across the five levels of influence. The identified individual-level risk factors do not accurately capture the complexity of the syndrome of infant mortality.
Conclusions

Determining *why* infants die, does not address why *more* black infants die than white infants.

Structural determinants of health drive racial-ethnic *disparities* in infant mortality and not individual-level risk factors.

Health effects of some structural determinants of health (e.g., income inequality) are race-specific in the US.

It is most efficient for programs to be available to the entire community because the vastly higher number of low risk individuals produce more infant mortality than the much smaller population of high risk individuals.