Developing and using evidence to make motherhood safer in Jamaica

Launch of the Caribbean Branch of the United States Cochrane Center and Symposium: Translating Research for Policy Impact & Practice: An Evidence-Based Approach
June 6th & 7th 2013

Affette McCaw-Binns, MPH, PhD
Reproductive Health Epidemiologist
Department of Community Health & Psychiatry
UWI, Mona
1981-83 • Confidential Enquiry into Maternal Deaths

1986-87 • Jamaica Perinatal Morbidity & Mortality Study

1992-95 • Hypertension in Pregnancy Project

1998 onward • Maternal Mortality Surveillance
Jamaica: by health region

Western RHA
20% births

North East RHA
13% births

Southern RHA
22% births

South East RHA
45% births
Vital registration and maternal mortality: 1877 - 1979

MM RATIO

1st Confidential Enquiry into Maternal Deaths: 1981-83

Political Independence
Confidential Enquiry into Maternal Deaths

Findings: Age, parity and maternal mortality: 1981-83

Maternal Age and Parity Graphs

Maternal Age:
- Age groups: 15-20, 25-30, 35-40, 40+
- Number of births: 0, 50, 100, 150, 200, 250, 300, 350, 400

Parity:
- Parities: 1, 2, 3, 4, 5+
- Number of births: 0, 20, 40, 60, 80, 100, 120
Policy & Impact:
1981-83 Confidential Enquiry: Maternal Deaths

• **Policy:**
  – Teenagers, first time mothers
  – Women over 30 years, grand-multiparæ
    • Must be referred to hospital for delivery

• **Impact:**
  – 1983-1990: hospital births increased from 70% - >95%
  – Stimulated interest in more comprehensive information on the management of pregnancy and its impact on neonatal outcome

Jamaica Perinatal Morbidity and Mortality Study: 1986-87
Jamaica Perinatal Morbidity & Mortality Survey (JPMMS)

- IDRC funding: September 1986 – August 1987
  - All births: 2 months (cohort study)
  - All neonatal admissions: 6 months (morbidity study)
  - All deaths - perinatal & maternal: 12 months (mortality study)
  - Health service evaluation: hospital & community care

Findings - JPMMS: Antenatal care

• Community midwives:
  – 94% ordered VDRL test for syphilis
  – 25% waited over 2 months for VDRL results
  – Many infants born with congenital syphilis

• Policy Response:
  – Introduction of rapid tests to screen for syphilis
  – Immediate initiation of treatment for sero-positive women

Source: National HIV/STI Control Program, Jamaica
Findings - JPMMS: Delivery care

• 18% of observed deliveries unattended
  – Poor layout of labour wards
  – Inadequate staffing/overcrowding

• Overcrowding
  – Bed occupancy at Referral [Type B] hospitals (86-93%)
  – 39% of beds at 2 Type B hospitals shared

• Policy response:
  – Layout of labour/delivery wards re-designed
  – Bed complement at 3 of 4 Type B hospitals expanded (doubled in some instances)
Findings - JPMMS: Vital Registration

• Vital registration
  – Only 9% NNDs, 12% fetal deaths registered
    • 94% live births registered by age 1
  – Outdated, paper based system
  – Registrar General’s Department (RGD)
    • Poor state of repair

• Policy Response:
  – World Bank/GOJ Social Sector project
    • Rebuild/modernize the RGD
    • Correct deficiencies in birth and death registration
    • Improve service delivery

- Hypertension
- Haemorrhage
- Abortive outcomes
- Infection
HYPERTENSION IN PREGNANCY
PROJECT: 1992-95
Hypertension in Pregnancy Project: Intervention and Control Areas

Quasi-experimental design
Hypertension in pregnancy project

• Objectives
  – Test evidence based strategy to reduce morbidity

• Method
  – Develop model for high risk antenatal care
    • Clinical guidelines
    • Training
    • Weekly referral AN clinics
    • Monitoring adverse events
Maternal Education Card,
Jamaica

PREGNANT! HAVING ANY OF THESE?

- Seeing spots, seeing double, unable to see
- Vomiting in late pregnancy
- Vaginal bleeding
- Headache above the eyes
- Swollen hands, feet or face
- Belly ache

ACT NOW!

CHECK WITH
Field visit to an eclamptic patient

- Porter issued appointments
  - Referred patients sent home without being seen
- All attendees triaged by RM
- Non-compliance
- Every referred patient given repeat visit following week to health centre
  - Home visit if didn’t return
- Patients presenting to A&E with prodromal signs sent home (antacid; analgesia)
- Bypass A&E if 3rd trimester
## Findings

**Eclampsia: Cases per year and odds of occurrence in intervention area**

<table>
<thead>
<tr>
<th>Year</th>
<th>Intervention</th>
<th>Control</th>
<th>OR [95% CI]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986-91</td>
<td>84</td>
<td>50</td>
<td>1.00 [reference]</td>
</tr>
<tr>
<td>1992</td>
<td>13</td>
<td>9</td>
<td>0.86 [0.34, 2.15]</td>
</tr>
<tr>
<td>1993</td>
<td>11</td>
<td>10</td>
<td>0.66 [0.26, 1.66]</td>
</tr>
<tr>
<td>1994</td>
<td>8</td>
<td>13</td>
<td>0.37 [0.14, 0.95]</td>
</tr>
<tr>
<td>1995</td>
<td>4</td>
<td>13</td>
<td>0.18 [0.06, 0.58]</td>
</tr>
</tbody>
</table>

P (trend) <0.001
### Outcome effect on admissions

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eclampsia</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. admitted /year</td>
<td>13</td>
<td>4 *</td>
</tr>
<tr>
<td>No. bed days /year</td>
<td>108</td>
<td>20 ****</td>
</tr>
<tr>
<td><strong>All hypertension related admissions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. admitted /year</td>
<td>252</td>
<td>150 ****</td>
</tr>
<tr>
<td>No. bed days /year</td>
<td>2255</td>
<td>1038 ****</td>
</tr>
</tbody>
</table>

*P<0.05; **** P<0.0001
Impact

• Process rolled out into all the health regions
• High risk ANCs established at referral Type A & B hospitals
  – Re-referral of women with short-term acute problems to midwifery team
    • Reduce overcrowding & waiting times
Jamaica, parishes by highest level hospital services
Impact: DIRECT causes of maternal death, Jamaica: 1981-2006 (ratio /100,000 live births)
Finding: 1993-95 Maternal Mortality Study

Maternal mortality, by access to care in parish of residence: 1986-1995

<table>
<thead>
<tr>
<th>Type</th>
<th>1986-87</th>
<th>1993-95</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type A (tertiary)</td>
<td>64</td>
<td>80</td>
</tr>
<tr>
<td>Type B (referral)</td>
<td>132</td>
<td>99</td>
</tr>
<tr>
<td>Type C (midwifery)</td>
<td>193</td>
<td>167</td>
</tr>
</tbody>
</table>

- Type A (tertiary)
- Type B (referral)
- Type C (midwifery)
- New B

- 1986-87
- 1998-00
- 2004-7
- 2010-12
Maternal Mortality surveillance: 1998 onward

- **1981-83**
  - Walker et al

- **1986-87**
  - Keeling et al
    - Voluntary reporting

- **1993-95**
  - McCaw-Binns et al
    - >95% hospital births
      - Monitor hospital maternal deaths

- **1998**
  - Maternal deaths = Class I notifiable event
  - All maternal deaths reported to Ministry of Health, on suspicion

- **Active surveillance**
  - Monitoring hospitals by surveillance officers
Maternal Mortality surveillance

• **Maternal deaths = Class I notifiable event**
  – Case review includes:
    • Clinical summary of inpatient management
    • Post mortem report
    • Home visit (verbal autopsy)
    • Antenatal care report
  – Multidisciplinary team (midwives, obstetricians, pathologists, epidemiologists) review case and:
    • Decide on the cause of death
    • Identify areas for intervention
    • Report findings to Ministry of Health

• **National committee**
  – Address policy issues
Reporting to Surveillance Unit, Ministry of Health: by year, maternal deaths (WHO definition)*

*Direct & indirect maternal deaths, to 42 days post partum
Evaluation: Cases missed by surveillance in 2008

- 8/51 (15.7%) maternal & 11/18 (61.1%) late maternal deaths
  - Community (8): 3 maternal; 5 late
  - Hospital (11): A&E (4), ICU (1), KPH (4); medical ward (2)

- Missed maternal deaths (pregnant – 42 days post partum)
  - Direct: Ectopic pregnancy (4); abortion (1)
  - PPH (1); PP eclampsia (1); puerperal sepsis (1).

- Missed late maternal deaths (43-364 days post partum)
  - Direct: Cardiomyopathy (3); Unspecified hypertension (1); fatty liver disease(1).
  - Indirect: Cardiac (2); stroke (1); breast cancer (1); DM (1)
Changing epidemiology I
(ratio/100 000 live births)
UNDERSTANDING THE PROBLEM:
USING THE EVIDENCE

Changing demography I
Births by parity (previous live births): 1980-2010
Changing demography II
Births by maternal age(n): 1980-2010

Number

<20 | 20-24 | 25-29 | 30-34 | 35+

Changing fertility
Age specific fertility rates: 1975-2008
Counting reproductive performance

Fertility rate per 1000 women, maternal mortality ratio per 100,000 live births, maternal mortality rate per million women 15-49 years: 1981-2012, Jamaica

GFR

- 1981-83: 115
- 1984-86: 98
- 1993-95: 85
- 1998-00: 74
- 2001-03: 65
- 2004-06: 60
- 2007-09: 57
- 2010-12: 52
Monitoring programme effectiveness?

Fertility rate per 1000 women, maternal mortality ratio per 100,000 live births, maternal mortality rate per million women 15-49 years: 1981-2012, Jamaica

![Graph showing fertility rate and maternal mortality ratio trends from 1981 to 2012 in Jamaica. The fertility rate decreases from 115 in 1981 to 52 in 2012, while the maternal mortality ratio decreases from 111 in 1981 to 88 in 2007-9, and then stabilizes at 92 in 2010-12.](image-url)
Monitoring programme effectiveness?

Fertility rate per 1000 women, maternal mortality ratio per 100,000 live births, maternal mortality rate per million women 15-49 years: 1981-2012, Jamaica
Challenges:
INDIRECT deaths: 1981-2012
(ratios/100 000 live births)

MMR

HIV/AIDS
Sickle cell

Challenges:
INDIRECT deaths: 1981-2012
(ratios/100 000 live births)
Issues needing research

• Management of medical complications of pregnancy
  – Pre-conception education and care
  – Multidisciplinary antenatal care
    • Obstetrician + Physician
      – Needs to be evaluated
  – More technical capacity
    • High dependency units /tertiary care for women with:
      Sickle disease in crisis
      Cardiac conditions
      Severe pre-eclampsia & its complications (e.g. stroke)
      Post partum haemorrhage

• Continuity of care after 6 weeks post partum
  – Most late deaths due = sequelae of medical conditions
Issues needing research

• Why has direct mortality started to increase?
  – Audit eclampsia cases and deaths
  – Review case management
  – Examine training, deployment and retention of community midwives
  – Integrate HIP guidelines into curricula
Critical directions for the future

• Improve quality of care and access
  – Reduce unresponsive service points
    • Unhelpful/rude health personnel
    • Unfriendly opening hours
    • Reduce opportunity cost of seeking care
  – Encourage involvement of male partners
    • Attend antenatal care
      – Screening, counseling
    • Accompany partner at delivery