MATERNAL MORTALITY

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MATERNAL MORTALITY

At Turn Of 20th Century

Up to 10% (or more) of births were associated with maternal death.

MATERNAL MORTALITY

At Onset Of WW II

About 6.1 per 1000 live births in the USA

MATERNAL MORTALITY

1990s

About 10 per 100,000 live births in the USA

By YTK we were able to express maternal deaths in single and double digits per thousands rather than in percentages.

PUERPERAL SEPSIS

Important Contributors To Maternal Death Reduction

INVESTIGATOR	YEAR	CONTRIBUTION
Hippocrates	400 BC	1st to recognize, observe, and record case of puerperal sepsis
Charles White	1773	1st to recognize it was infectious
Oliver Wendell Holmes, Sr	1843	1st to recognize it was contagious
Ignatz Philipp Semmelweiss	1848	1st to reduce mortality by washing hands with chloride of lime
Alexander Flemming	1929	Discovered penicillin

HEMORRHAGE

Important Contributors To Maternal Death Reduction

EVENT	INVESTIGATORS	YEAR
Anesthesia	John Snow James Young Simpson	1846 (Chloroform) 1847 (Ether)
Blood Types	Karl Landsteiner	1902
Rh factor	NIH Investigators	1940
Safer transfusions	Blood Technologists	1950s

MATERNAL MORTALITY

Are we still making progress?

MATERNAL DEATH

WHO Definition

Death of a woman who is pregnant or who died within 42 days of the end of her pregnancy, regardless of duration of pregnancy, location of pregnancy, or cause related to pregnancy or aggravated by pregnancy, or related to management of pregnancy, but not by accidental or incidental causes.

Pregnancy-Related Death

CDC Definition

- **Death of a woman during pregnancy or within one year of the end of pregnancy,**
  - ***From a pregnancy complication,***
  - ***From a chain of events initiated by pregnancy, or***
  - ***From the aggravation of an unrelated condition by the physiologic effects of pregnancy***

MATERNAL DEATH

Panama's Definition

Death of a woman in which investigation determines that pregnancy, delivery, obstetric complication, or management complication was the direct or indirect cause of death, if death occurs within one year of the obstetric event.

MILLENIUM DEVELOPMENT GOAL

(MDG)

A 75% reduction in global maternal mortality between 1990 and 2015.

MATERNAL MORTALITY

How Are We Doing?

YEAR	MATERNAL DEATHS
1990	550,000
2008	350,000

Up to 2008, only a 36.6% reduction in global maternal mortality.

Saly L, Chou D, Gemmill A, *et al*. *Global causes of maternal death*: a WHO systematic analysis.
Lancet Global Health. 2014;2(6):e323-33

MATERNAL DEATHS

During The Study Period

2,443,000

If we take an average of 244,300 deaths per year up to 2012

We will have achieved a reduction of 55.6 % in maternal deaths up to then.

PROBLEM

The reduction in maternal mortality has not been uniform across the globe.

287,000 women die each year in developing countries *because of pregnancy complications*!

MATERNAL MORTALITY

Differences Within Countries

Higher rates of death are found among more economically disadvantaged women.

MATERNAL MORTALITY

Differences In The USA

Black women are three to four times as likely as white women to die during pregnancy or childbirth.

Sub-Saharan Africa

Has the greatest burden of maternal mortality.

Yet there, too, the story is not uniform.

Maternal mortality rates have in fact *increased* in some countries.

Sub-Saharan Africa

Maternal Mortality Trends

- **Most countries in the region have small, but promising decreases in maternal mortality**
- **Countries with substantial increases tend to fall in two categories**
  - ***Countries whose health systems have been decimated by war or internal conflict***
    - ***Congo, Sierra Leone, Ethiopia, Somalia, Zimbabwe, Sudan for example***
  - ***Countries with extremely high rates of infection with HIV***
    - ***South Africa, Botswana, Swaziland, Lesotho, Kenya, Zimbabwe, Zambia***

WHO Worldwide Study

Jan 1, 2003 to Dec 31, 2012

Most common causes of maternal death, worldwide.

MATERNAL DEATHS

Causes

CAUSE	NUMBER	PERCENTAGE
Direct Obstetric	1,771,000	73 %
Indirect Obstetric	672,000	27 %

MATERNAL DEATHS

Direct Obstetric Causes

CAUSE	PERCENTAGE
HEMORRHAGE	27.1 %
HYPERTENSIVE DISORDERS	14.0 %
SEPSIS	10.7 %
ABORTION	7.9 %
THROMBO-EMBOLIC DISORDERS	3.2 %
OTHER DIRECT CAUSES	9.6 %

Hemorrhage, hypertensive disorders, and sepsis were still responsible for more than half of maternal deaths worldwide.

PREGNANCY-RELATED DEATHS

Most Common Causes In The USA

- **Postpartum hemorrhage**
- **Hypertensive disorders**
- **Venous thromboembolism**

MATERNAL MORTALITY

Most Common Causes In Panama

- **Obstetric hemorrhage**
- **Hypertensive disorders of pregnancy**
- **Puerperal sepsis**

Postpartum Hemorrhage

Bienstock JL, Eke AC, Hueppchen NA. Postpartum Hemorrhage. N Engl J Med 2021;384:1635-45

The leading (and preventable) cause of maternal illness and death globally.

POSTPARTUM HEMORRHAGE

Can Lead To:

- **Severe anemia**
- **DIC**
  - ***Disseminated Intravascular Coagulopathy***
- **Hysterectomy**
- **Multisystem organ failure**
- **Death**

Worldwide, one woman dies from postpartum hemorrhage every 7 minutes.

POSTPARTUM HEMORRHAGE

Maternal Death Worldwide

WORLD AREA	PERCENTAGE OF PPH DEATHS
DEVELOPED REGIONS	18%
DEVELOPING REGIONS	82%

With 11% of world deaths by postpartum hemorrhage, the USA has the highest rate of postpartum hemorrhage mortality among developed countries.

POSTPARTUM HEMORRHAGE

There Are Two Types

- **Primary postpartum hemorrhage**
  - *Occurs within first 24 hrs following delivery*
- **Secondary postpartum hemorrhage**
  - *Occurs 24 hrs to 12 weeks after delivery*

POSTPARTUM BLOOD LOSS

How Is It Controlled Naturally?

- **By uterine contractions principally**
- **By activation of the coagulation cascade secondarily**

What Are The Causes Of PPH?

"4 Ts"

- **Tone**
  - *Uterine contractions*
- **Trauma**
  - *Uterine and perineal lacerations*
- **Tissue**
  - *Retained fragments of placenta*
- **Thrombin**
  - *Clotting factor deficiency*

POSTPARTUM HEMORRHAGE

Frequency Of Causes

PPH CAUSE	FREQUENCY
UTERINE ATONY	70 %
LACERATIONS	20 %
RETAINED PLACENTA	10 %
CLOTTING FACTOR DEFICIENCY	<1 %

Lifetime Risk For Pregnancy-Related Death

For Year 2014

REGION	RISK OF DEATH
USA	1 in 2,100
REPUBLIC OF PANAMA	1 in 1,428
CHIRIQUI PROVINCE	1 in 763
SUB-SAHARAN AFRICA	1 in 31

MATERNAL DEATHS IN 2014

Chiriqui Region

MOTHERS FROM	PERCENTAGE OF DEATHS
CHIRIQUÍ PROVINCE	40 %
NGÄBE BUGLÉ COMARCA	35 %
BOCAS DEL TORO PROVINCE	25 %

MATERNAL DEATHS IN CHIRIQUI

By Type Of Death

CLASSIFICATION	PERCENTAGE
DIRECT OBSTETRIC	42.5 %
INDIRECT OBSTETRIC	57.5 %

CAUSES OF DEATH

Chiriquí Region

DIAGNOSIS	PERCENTAGE
HIPERTENSIVE DISORDER	12.5 %
OBSTETRIC HEMORRHAGE	10.0 %
SEPTIC SHOCK	10.0 %
THROMBO-EMBOLIC DISORDER	07.5 %
OTHER CAUSES	60.0 %

OTHER CAUSES OF DEATH

Chiriquí Region

DIAGNOSIS	%
PULMONARY SEPSIS	14.7 %
ORGANO-PHOSPHORIC INTOXICATION	8.8 %
ACUTE HEPATIC INSUFFICIENCY	5.8 %
MILIARY TUBERCULOSIS	3.1 %
MASSIVE HEMOTHORAX	2.9 %
MITRAL STENOSIS	2.9 %
CONGESTIVE HEART FAILURE	2.8 %
HEMOGLOBINOPATHY	2.7 %
CHORIOCARCINOMA	2.0 %
OTHER MALIGNANCIES	4.3 %

PRENATAL CARE OF WOMEN WHO DIED

Chiriquí Region

PRENATAL CARE	%
No Data	12.5 %
None	15.0 %
Less than 5 visits	47.5 %
Five or more visits	25.0 %

MATERNAL DEATHS IN CHIRIQUI

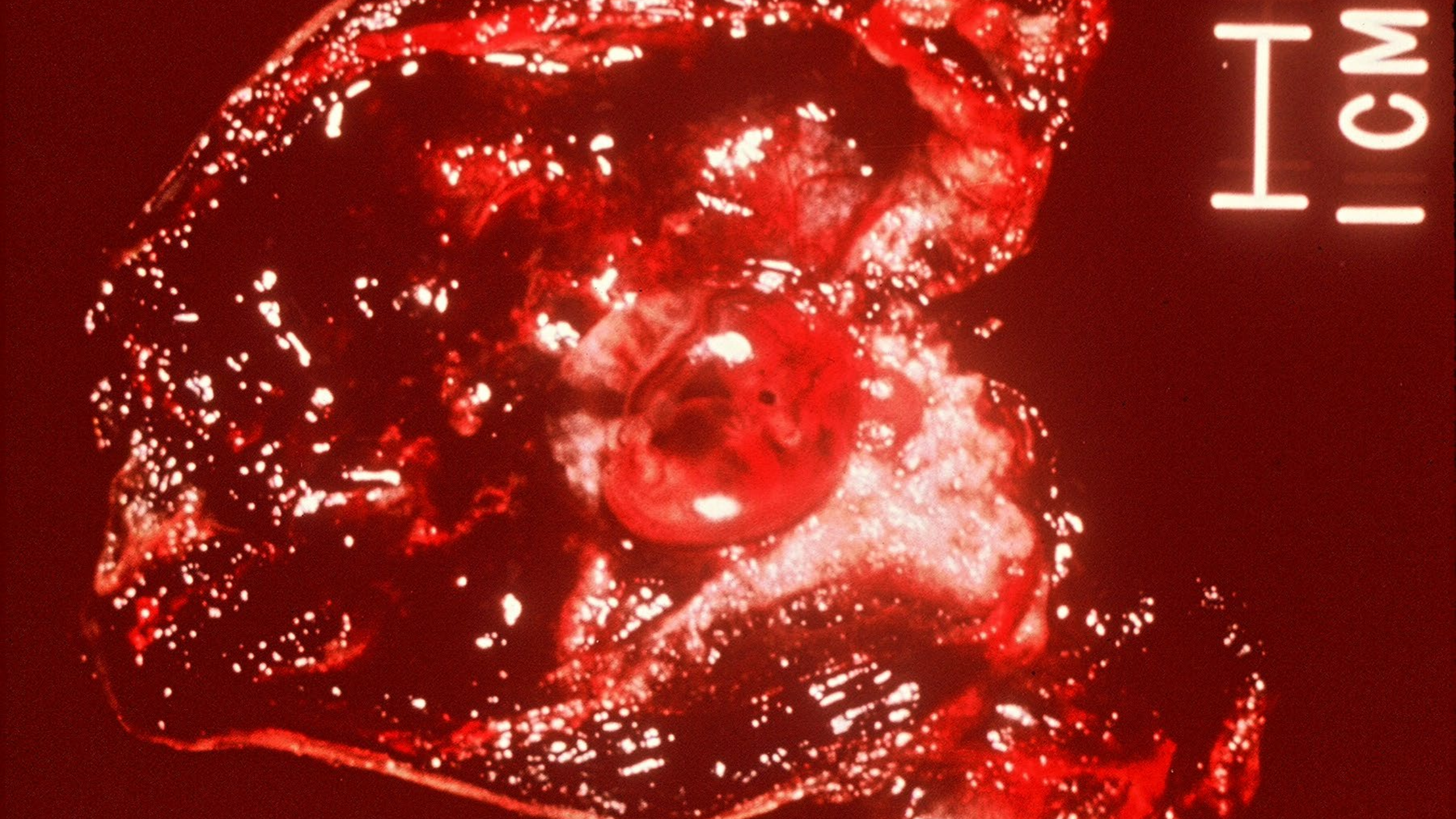
By Location Where Death Occurred

PLACE OF DEATH	PERCENTAGE
IN HOSPITAL	84 %
OUT OF HOSPITAL	16 %

MATERNAL DEATHS IN CHIRIQUI

By Obstetric Outcome

OUTCOME	PERCENTAGE
DIED PREGNANT	32.5 %
DIED FOLLOWING C-SECTION	30.0 %
DIED FOLLOWING VAGINAL DELIVERY	32.5 %
DIED FROM ECTOPIC PREGNANCY	05.0 %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MATERNAL DEATHS IN CHIRIQUI

By Labor And Delivery Attendant

L & D Attendant	PERCENTAGE
PHYSICIAN	52.5 %
Relative or Neighbor	10.0 %
DID NOT DELIVER	37.5 %

MATERNAL DEATHS IN CHIRIQUI

By Type Of Care In Hospital

TYPE OF CARE	PERCENTAGE
MEDICAL	70.0 %
SURGICAL	17.5 %
DOA	12.5 %

MATERNAL MORTALITY IN CHIRIQUI

Following Chart Review And Autopsy Report

VERDICT	PERCENTAGE
PREVENTABLE DEATH	92.5 %
NOT PREVENTABLE DEATH	7.5 %

IF DEATH WAS PREVENTABLE

Why Did It Occur?

Because Of Delay In Seeking Or Providing Medical Care!

DELAYS IN SEEKING MEDICAL CARE

There Are Three Types

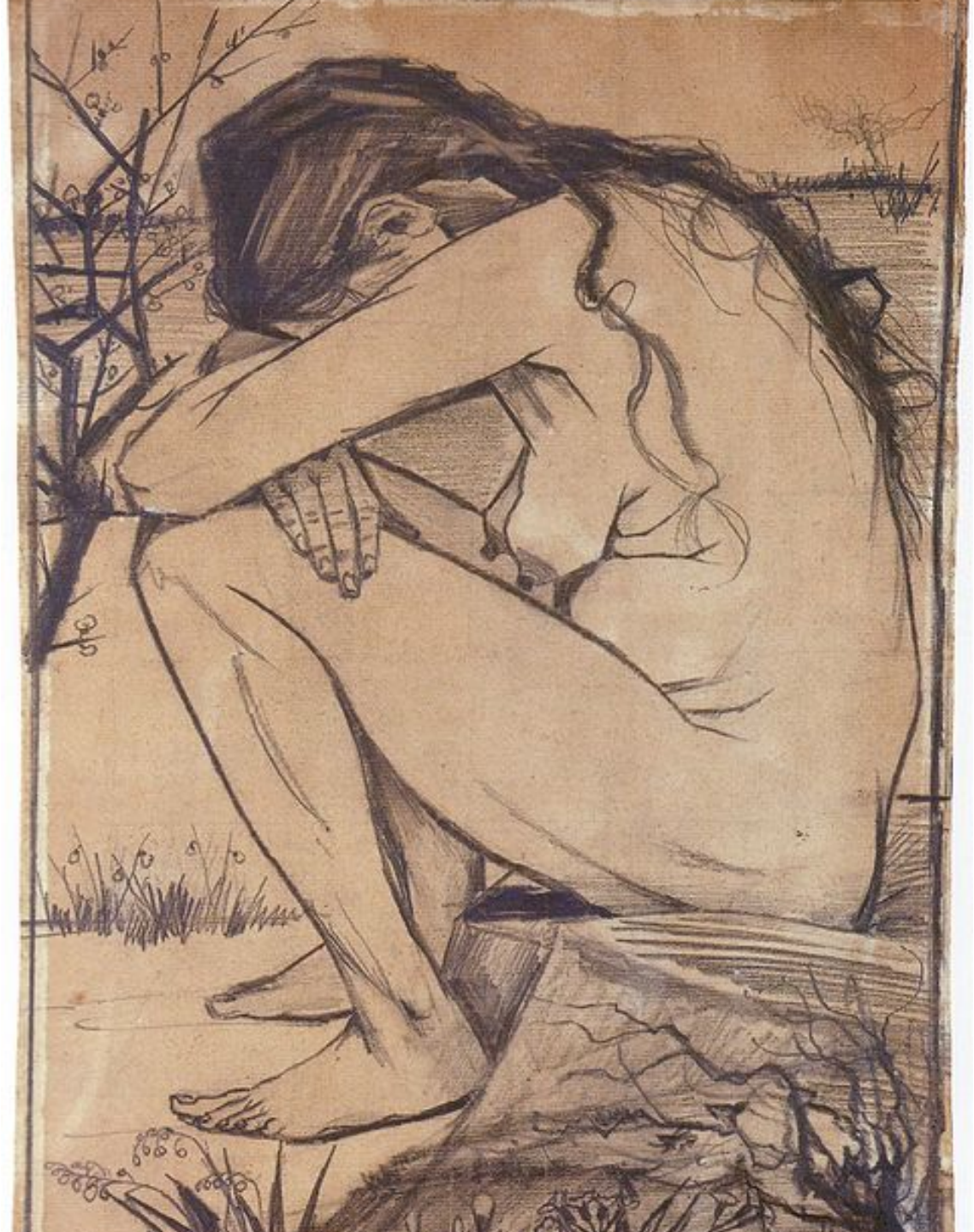
TYPE	DUE TO:	PERCENTAGE
FIRST DELAY	Remain home too long	80 %
SECOND DELAY	Trip to ER	5 %
THIRD DELAY	Wait in ER	15 %

But there is more to the story!

Much more…

MATERNAL DEATH

Is only the tip of the iceberg



For every woman who dies from a pregnancy-related cause, about 20 more experience injury, infection, disease, or disability.

This amounts to about seven million women yearly!

MATERNAL DEATHS

Also Affect Childhood Deaths

A high percentage of infants who die before the age of one, die because of deficiencies in the care of pregnant women during prenatal care and/or during delivery.

TRENDS IN MATERNAL MORTALITY

Key Common Factor

Access to good obstetrical care!

How Can We Reduce Maternal Mortality?

By Improving Care In Two Areas!

- **Hospital management of obstetrical emergencies**
- **Access to prenatal ambulatory care**

PREGNANCY-RELATED DEATHS

How Can We Reverse The Trend?

- **Hospitals can expand their focus on preventable causes of obstetrical complications and related deaths.**
- **Implement multidisciplinary staff meetings to assess and review each obstetrical patient's risk factors.**
- **Staff can simulate obstetrical emergencies in the Labor and Delivery area.**
- **Have hospitals use the Maternal Health Compact.**

PREVENTABLE CAUSES OF OBSTETRIC COMPLICATIONS

- **Create "bundles" of best practices for improving practices in maternity care.**
- **Bundles should include:**
  - ***Readiness***
  - ***Recognition***
  - ***Response***
  - ***Reporting protocols***
- **Costumized Protocols should be posted, reviewed regularly, and made available to all clinicians.**

IMPLEMENT MULTIDISCIPLINARY STAFF MEETINGS

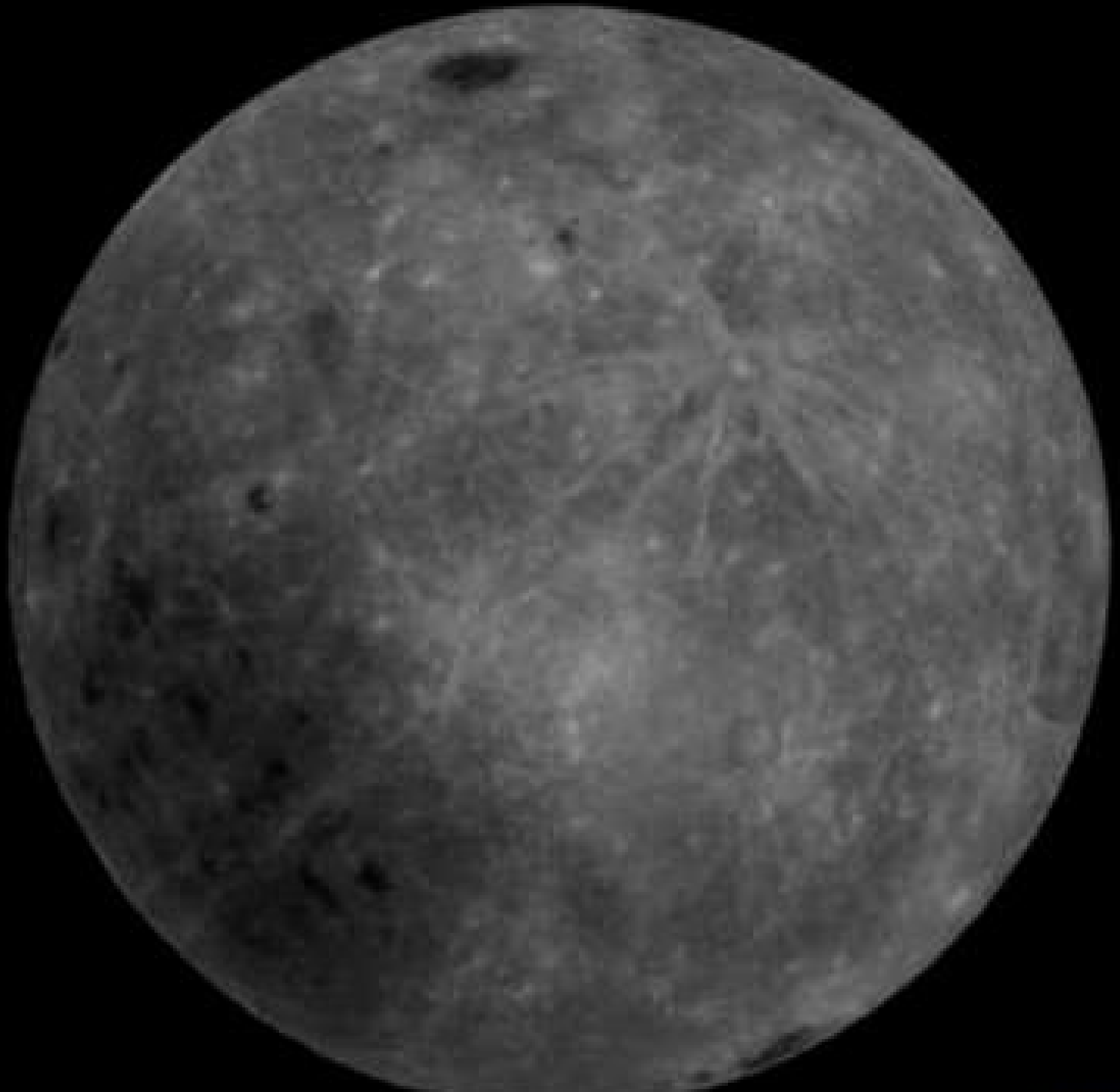
- **Briefings with surgeon, nurses, scrub technicians, pediatricians, and anesthetist for patients undergoing elective or emergency cesarean sections to identify:**
  - ***Shared understanding of the patient and the procedure***
  - ***Safety concerns about this particular patient***
  - ***What additional resources might be needed in the event of an unexpected complication***
- **Communicate concerns to patient and family members that she authorizes.**
- **Shared decision making by patient and obstetrical team.**

SIMULATE OBSTETRICAL EMERGENCIES

- **They elucidate for staff members critical timings and logistics involved in emergencies.**
  - ***How long it takes to get products from the blood bank?***
  - ***Where to find a hemorrhage cart?***
  - ***Where to find infrequently used medications?***
  - ***What is in a crash cart and how to use what's in there?***
- **Has staff reviewed the emergency protocol recently?**

DEVELOP AND USE MATERNAL HEALTH COMPACT

- **Formalize relationship with lower-resource hospitals and clinics that transfer pregnant women when they require higher levels of maternal care.**
- **Activate connections for immediate consultation**
  - ***In the event of an unexpected obstetric emergency whose care demands exceed their resources.***
  - ***For support of clinicians in challenging situations.***



IMPROVE PRENATAL CARE COVERAGE

Boquete Rotary Projects

- **Regular tours through La Comarca**
  - *Vehicle with essentials to monitor pregnant women*
- **Dr. Miriam Rittmeyer's Project**
  - *Training Ngäbe Buglé midwives*

Dr. Rittmeyer's Ngäbe Buglé Project

Manchichi Program

Based on Phalarope's Ixchel Midwife Program successfully implemented in 8 rural Mayan communities in Guatemala.

It is necessary to improve women's health worldwide!

Imperative to protect women's rights if we are to achieve this goal!

About 222 million women who would like to use contraceptives,

Are either denied the right to use them or have no access to them.

FAMILY PLANNING

What is it based on?

- **Respect for human rights**
- **Need for women's empowerment**
- **Respect for social equality**
- **Respect for social justice**

About 16 million girls between the ages of 15 and 19 years deliver babies every year.

And an unacceptable number of girls between the ages of 10 and 14 get pregnant every year.

Numerous studies have shown that,
***Women who plan their families*:**

- **Enjoy better health**
- **Have access to better education**
- **Are more likely to be empowered in their homes and communities**
- **Are economically more productive**

To ignore these unmet needs…

Is to accept the unacceptable!