DISPARITIES IN BREAST AND CERVICAL CANCER SCREENING AND TREATMENT IN RURAL AREAS

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CANCER FACTS AND STATISTICS

- Estimated 2022 Numbers in the US
  - 1.9 million new cancer cases[1]
  - ~610,000 deaths due to cancer[1]
  - That's 4 new cases and 1 death per minute[1]
- Breast cancer is the most prevalent cancer worldwide.[2]
  - Occurs in every single country of the world[2]
- Cervical cancer is the 7th most prevalent cancer worldwide.[3]
  - 4th most common cancer in women[3]

GLOBAL RATES OF BREAST CANCER

- ~2.3 million new breast cancer diagnoses made in 2020 [2]
- ~685,000 deaths due to breast cancer in 2020 [2]
- Number of cases higher in developed countries
  - Areas with the highest number of cases based on population [4]:
    - Australia, New Zealand, Western and Northern European countries, North America
- Mortality rate higher in developing countries
  - Areas with the highest mortality rates based on population [5]:
    - Barbados, Fiji, Jamaica, Bahamas, Papua New Guinea

Figure 1. Global mortality rates of breast cancer[6]

RATES OF BREAST CANCER IN THE UNITED STATES

- ~290,000 new breast cancer diagnoses will be made in 2022 [1]
- ~44,000 deaths will be due to breast cancer in 2022 [1]
- Number of cases are higher in New Hampshire, Connecticut, and Hawaii [4]
  - Not the most conclusive data because there are a lot of outliers
  - Based on multiple factors that can change on yearly basis to significantly influence numbers
    - Access to imaging, rural screening efforts, population
- Mortality rates are higher in DC, Mississippi, and Oklahoma [4]
  - Similar and different factors play a role
    - Access to screening, providers, and treatment
    - Late-stage diagnosis in more rural areas of a state
      - Some states may have a larger rural population due to size of the state

Figure 2. Lifetime Risk of Breast Cancer in Females[6]

GLOBAL RATES OF CERVICAL CANCER

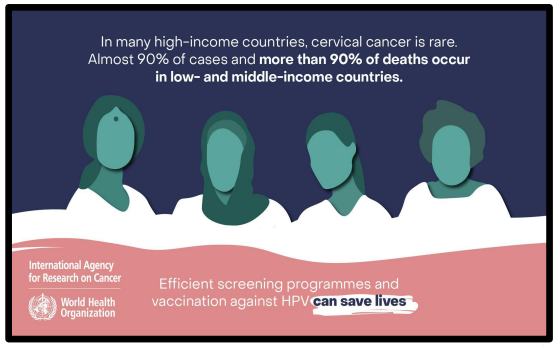


Figure 3. Cervical cancer statistics[2]

- ~604,000 new cervical cancer diagnoses made in 2020[3]
- ~342,000 deaths due to cervical cancer in 2020[3]
- Number of cases and mortality rates are higher in low-resource countries[3]
  - Areas with the highest number of cases based on population[3]:
    - Eswatini, Malawi, Zambia, Zimbabwe, Tanzania, Uganda
  - Areas with the highest morality rates based on population[3]:
    - Eswatini, Malawi, Zambia, Zimbabwe, Tanzania, Uganda
- Little variation in the top 10 countries in both cases and mortality rates
  - Both lists are almost identical

RATES OF CERVICAL CANCER IN THE UNITED STATES

- ~14,100 new cervical cancer diagnoses will be made in 2022 [1]
- ~4,300 deaths will be due to cervical cancer in 2022 [1]
- Women are most frequently diagnosed between the ages of 35-44, but average age at time of diagnosis is 50 [7]

SCREENING GUIDELINE

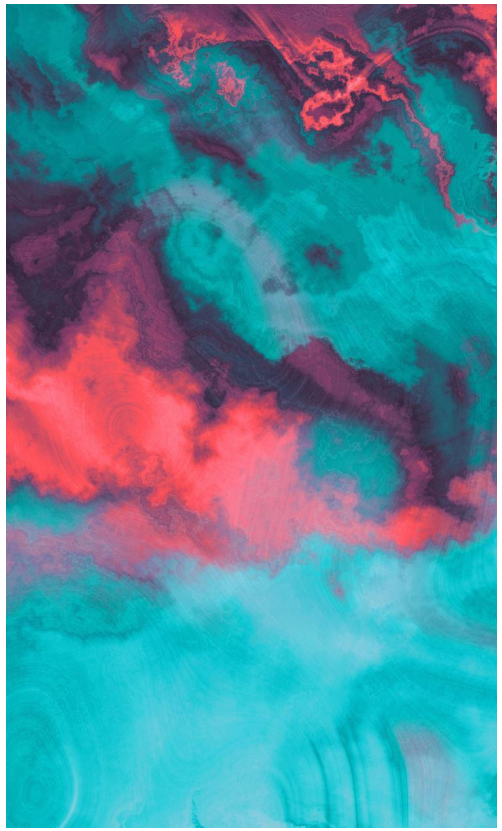
American Cancer Society[1]

- Breast Cancer
  - Ages 40-45: individual choice
  - Ages 45-54: every year
  - Ages 55 and up: every two years or every year (if preferred by patient)
- Cervical Cancer
  - Ages 25-65: primary HPV test every 5 years

United States Preventive Screening Task Force [2]

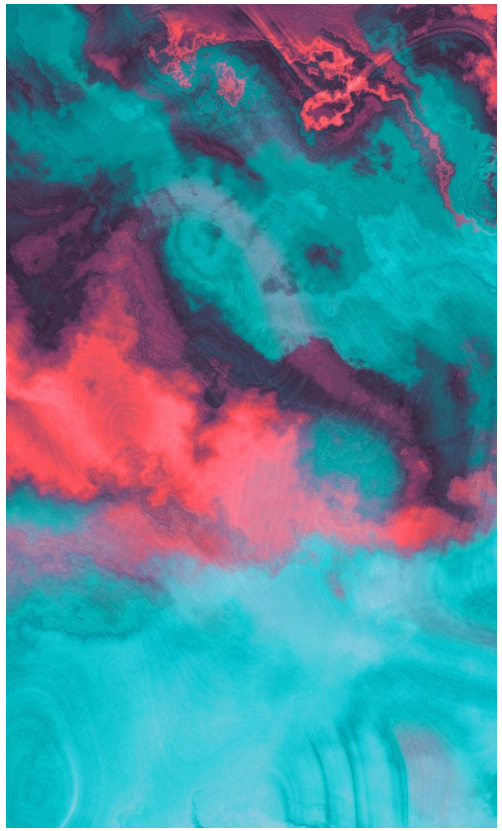
- Breast Cancer
  - Ages 40-49: individual choice
  - Ages 50-74: every two years
- Cervical Cancer
  - Ages 21-29: cytology every 3 years
  - Ages 30-65: cytology every 3 years, primary HPV test every 5 years, or co-testing every 5 years

IMPACT OF RURAL LIVING: BREAST AND CERVICAL CANCERS



- Rural living is often considered a risk factor for poorer cancer outcomes, due to accessibility of timely screening and treatment.
  - Similar outcomes to urban patients if access to timely screening and treatment is comparable[8]
  - Significantly increased odds of late-stage diagnoses of breast and cervical cancer[8]
    - Why is this a notable finding, particularly in breast cancer?
- Rural living as a protective factor in breast care incidences
  - Number of breast cancer diagnoses is increased in urban populations compared to cervical cancer incidence, which is increased in rural populations.[9]
- Differences in screening patterns, access to care, lifestyle, and socioeconomic factors vary depending on site of cancer and local community[8]
- Time between awareness of symptoms, 1st clinic visit, diagnosis, and treatment is increased in rural patients[10]
  - Average time between awareness of symptoms to diagnosis of cervical cancer in Ethiopian women was 30 weeks.[10]
  - Average time between awareness of breast cancer symptoms to first clinic visit in Ethiopian women was 81 weeks.[10]
  - Typically results in poorer outcomes due to delay in taking an initial or next step

DISPARITIES IN SCREENING THE RURAL POPULATION FOR BREAST AND CERVICAL CANCERS



- Emotional and physical discomfort during breast and cervical cancer screenings[11]
  - Screenings for breast and cervical cancer through mammograms and pap smears are decreased in rural vs urban women.[9]
- Shortage of providers to initiate and perform screenings
- Lack of patient education in the importance of these screenings
  - Fear of cancer related death decreased number of screenings[12]
  - Only 25% of women screened at federally qualified health centers reported they knew the purpose of a pap smear[13]

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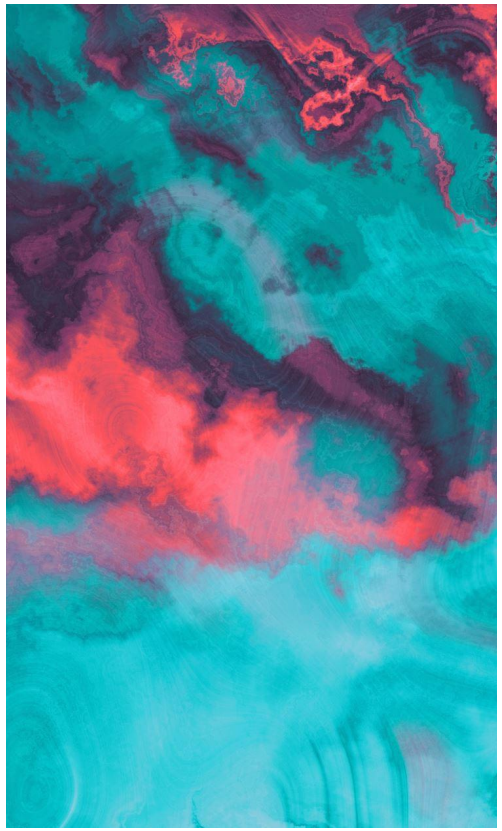
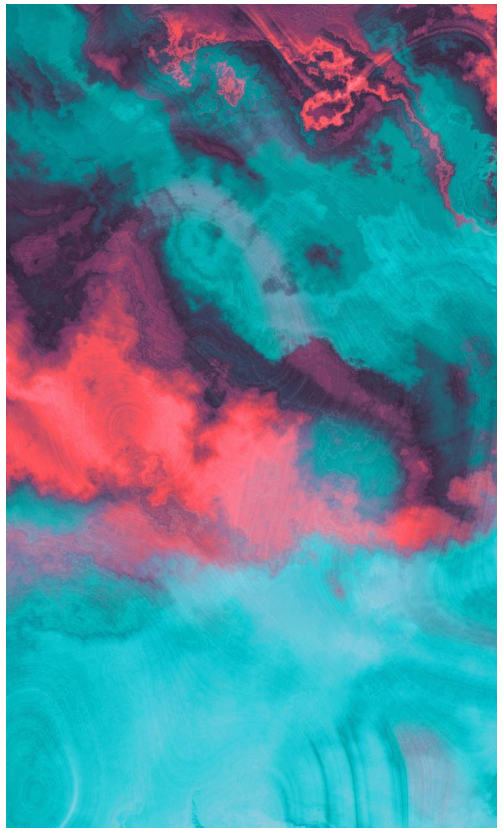


- Fear of cost
  - Cost is one of the biggest factors that prevents rural residents from getting screened.[12]
- Cultural variations and stigmas
  - Cultural views on modesty can decrease breast and cervical cancer screening rates.[12]
  - HPV is the most prevalent STI in the world and cause most cases of cervical cancer.[13]
- Mistrust of the medical system
  - Previous negative experience with healthcare
  - Family or friend had a negative experience

DISPARITIES IN TREATING THE RURAL POPULATION FOR BREAST AND CERVICAL CANCERS



- Lack of primary care providers in rural areas
  - Follow-ups after abnormal screenings
  - Referrals to oncologists and other specialists come from PCPs
  - Increased provider turn-over rates[13]
- Only 5.6% of oncologists in the US work in rural settings.[14]
- Transportation and travel distance to primary care or specialty offices
- Inadequate diagnostic capacities and weak referral systems in low-to-middle income countries[10]

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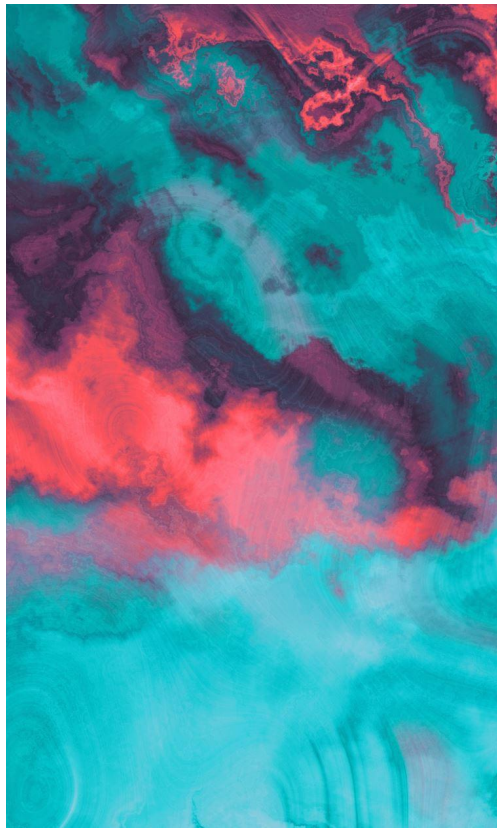

- Insurance status
  - Affordable Care Act mandates coverage of screenings, but cost-sharing for follow-up care[13]
  - Increased gatekeeping/referrals from PCPs to oncologists if universal healthcare, especially if patient lives in a rural area.[15]
  - Rural residents are less likely to establish care with a PCP.
  - Those enrolled in Medicaid, other public insurances, or those uninsured are all less likely to get screened for cervical cancer than those enrolled in private or military insurance.[13]

DISPARITIES IN EDUCATING THE RURAL POPULATION FOR BREAST AND CERVICAL CANCERS

- Health literacy
  - Obtaining, processing, and understanding health information in order to make an informed decision
- Misguided perceptions of breast and cervical cancer
  - Cancer is contagious.[10]
  - Cancer inevitably ends in death.[10]
- Misinformation about cost
  - Diagnosing and treating cancer can be incredibly expensive, but there are programs to help aid in cost that the patient may be unaware of.
  - Cost should not stop a patient from seeking help.
- Access to health-related resources and information
  - Studies show that this is an increasing demand with rural patients.[14]
  - Internet resources may not be an option.

RESEARCH IN RURAL POPULATIONS AND CANCER OUTCOMES

- More research needs to be done!
- Research will vary across all rural living, so it is crucial that local studies be conducted before reliable comparisons can be made on a larger scale.
- Important to remember that incidences of breast and cervical cancers will not be evenly distributed.

WAYS TO IMPROVE DISPARITIES

- Improve PCP density in rural areas
  - Increases patient accessibility
  - Loan repayment options
- Community-based education programs
  - Anyone can help
  - Allows for and demonstrates a support system
  - Calls or letters for reminders/overdue screenings improves screening rates[13]
- Develop and implement efficient screening programs
  - Invitations, mobile screening, extended hours, travel vouchers[13], HPV self-sampling[13]
  - Find an organized way of managing and monitoring screening performance to ensure thoroughness

WAYS TO IMPROVE DISPARITIES

- Develop and implement efficient follow-up strategies, regardless of screening results.
    - Can help eliminate miscommunication
    - Patient leaves screening with assurance of an answer
    - Phone calls, video calls (if accessible), in-person
    - Aid with transition of care and scheduling, if appropriate
- Provide cost transparency for follow-up care.
- Partnerships between healthcare systems and the community
- Get involved, advocate, and get others involved.
    - Anyone that wants to help has something to offer, medical or non-medical.

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