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Shifting the mean incident age for the five screenable cancers in Sulaymaniyah city-Iraq toward the younger age group, as a single-city experience for the last 12 years

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Abstract

Background and objective: Recent trends have indicated a shift in the mean incident age for screenable cancers toward younger populations. This study examines this shift in Sulaymaniyah city, Iraq, over the last 12 years, in comparison to the data of developed and regional countries.

Methods: A study was conducted on the data collected from health facilities in Sulaymaniyah. It focused on breast, colon, lung, prostate, and cervix cancers between the years 2011 and 2022.

Results: The typical age at which these five malignancies were diagnosed decreased significantly in Sulaymaniyah. (*P*-value less than 0.001). The most noticeable changes were in prostate and colon/rectum cancers. Compared to nearby and advanced countries, Sulaymaniyah's average ages of occurrence were mostly lower. This indicates that there is a local trend or early detection methods in practice in this region.

Conclusion: The study shows a big drop in average age of cancers found on screens in Sulaymaniyah. This implies that it is imperative to reevaluate cancer screening and prevention strategies, as the number young people falling ill has increased relative to previous years.

Keywords: Cancer epidemiology; Screenable cancers; Mean incident age; Sulaymaniyah; Early detection; Public health; Screening guidelines.

Introduction

In the last few years, cancer's spreading patterns around the world have been changing a lot. This phenomenon is particularly evident in the city of Sulaymaniyah, Iraq, where a notable trend has been observed in the age distribution of individuals diagnosed with the five screenable cancers: Breast, cervical, colon and lung cancers are some of the most common cancers.[1,2]

Usually, these types of cancers are linked with older people. However, new data from the health records in Sulaymaniyah show that nowadays, it is occurring to an increasing number of individuals who are younger. This change not only questions old health care ways and checking plans but also brings up new things about possible reasons. These might include environmental issues, changes in everyday life habits or someone's chance of having a certain disease because it runs in their family genes.[2]

The city's experience over the last twelve years encapsulates a blend of traditional and modern lifestyles, rapid urbanization, and evolving healthcare practices, all of which could contribute to this epidemiological shift. By focusing on this single-city experience, the study offers a microcosmic view of a potentially global trend, providing insights that could inform cancer screening and prevention strategies both locally and in similar contexts worldwide.[3] Furthermore, we compare the information from Sulaymaniyah with what's in richer countries and nearby nations like

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Turkey, Iran, Jordan, Israel Lebanon Saudi Arabia Kuwait. This helps to find common patterns or differences that go beyond country lines.[4]

There is a lengthy history of cancer research in large countries, as they are adept at providing health care and maintain a wealth of information regarding individuals who have contracted the disease. However, the rise of cancer in these countries might be very different compared to developing areas like Sulaymaniyah. By looking at these differences, we can learn about the many aspects of cancer statistics and how different things that affect health work together.[5]

Also, each country near Turkey like Iran, Jordan, Israel and Lebanon presents its own health care situation. Saudi Arabia joined them again with Kuwait to make an interesting group of people from different countries who all need help in their healthcare areas. These close-by countries have different levels of money status, health care systems and ways of life. These things could change how cancer is found in these places. This part of the study that compares different areas is very helpful. It gives a wide look at how cancer numbers are impacted by similarities and differences between places around the world.[6]

Methods

Study Design and Setting:

This retrospective observational study was performed in Sulaymaniyah city, Iraq, focusing on the five screenable cancers: Breast, cervical, colorectal, prostate and lung cancer. This 12-year have a look at, from 2010 to 2022, looked at how cancer instances changed in this town for a complete view.

Data Collection:

Data were taken from Hiwa cancer and blood disease in Sulaymaniyah. Medical records were checked to get information about age at cancer diagnosis, kind of disease, date found and simple personal details. All patient details were changed to make sure they stayed private and followed good practice rules.

Inclusion and Exclusion Criteria:

The study looked at people who got breast, cervical cancer and more during the research time. It included those with colorectal or prostate problems as well lung ailments. We left out cases that did not have all the age or date of diagnosis information, and if it was not confirmed by looking at tissues under a microscope.

Comparative Data Analysis:

For comparing different areas, we got the data from rich countries like Turkey, Iran and others nearby. This information came from well-known cancer records and research papers. This information was used to compare the average age for getting diagnosed and disease rates with those found in Sulaymaniyah.

Statistical Analysis:

Descriptive statistics were used to summarize the incident ages. The mean and median ages at diagnosis were calculated for each cancer type. *P*-value of <0.05 was considered statistically significant the ANOVA test is used to determine if there are statistically significant differences between the mean ages of individuals diagnosed with various types of cancer). All statistical analyses were conducted using SPSS version 25.

Ethical Considerations:

The study was conducted after formal approval from the Sulaymaniyah Directory of Health and Hiwa Cancer and Hematology Hospital.

Results

In 2011, the mean incident age for breast cancer was observed at 63.9 years, which showed a fluctuating decline over the 12-year period, reaching 55.4 years by 2022. Colorectal cancer presented with a mean incident age of 67.9 years in 2011, decreasing steadily to 54.9 years by the end of the study period. Lung cancer diagnoses began at a mean age of 62.0 years in 2011, with minor fluctuations

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throughout the years, eventually dropping to 54.3 years in 2022.

Prostate cancer demonstrated a similar declining pattern, starting at a mean age of 59.4 years in 2011 and descending to 55.2 years in 2022. The mean incident age for cervical cancer also decreased, from 61.0 years in 2011 to 56.5 years in 2022.

The overall trend for all screenable cancers combined (indicated by the green line) reflects a consistent decline in the mean incident age from 58.5 years in 2011 to 55.4 years in 2022. This overarching trend points to a significant shift toward younger age groups being diagnosed with these cancers over the study period in the Sulaymaniyah governorates. (Figure 1)

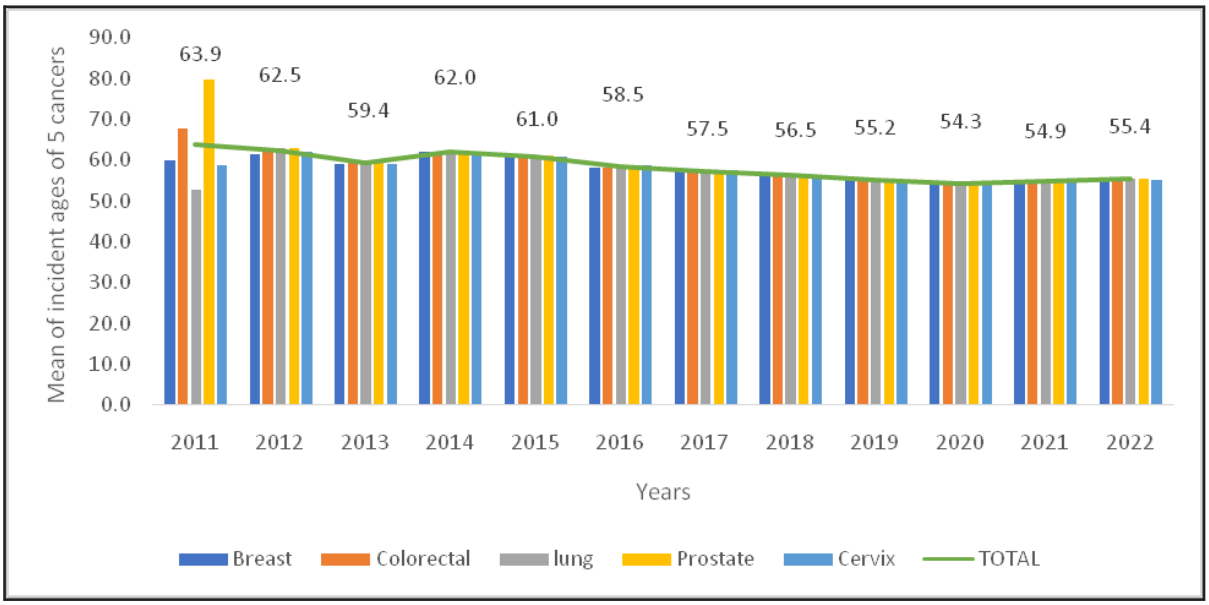

Figure 1 The five screenable cancer's mean incident ages

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The mean incident ages for breast cancer in Sulaymaniyah City from 2011 to 2022 have illustrated a statistically significant decreasing trend (*P*-value <0.001). The mean incident age commenced at 60.1 years in 2011, with an initial decrease to 59.2 years in 2012. A slight increase was observed in 2013, reaching 62.0 years, which represents the highest mean incident age within the period studied. Subsequently, a general downward trend was noted, with the mean incident age decreasing to 60.9 years in 2014.

A more pronounced decline commenced in 2015, with the mean incident age dropping to 58.3 years and continuing to decrease to 57.5 years in 2017. This trend persisted, with the mean incident age falling to 56.4 years in 2018, 55.3 years in 2020, and reaching its lowest at 54.4 years in 2021. In the final year of the study, 2022, a slight increase to 55.5 years was observed. (Figure 2)

Overall, the data indicates a clear trend of decreasing mean incident age for cancer in Sulaymaniyah city over the 12 years, with a minor increase noted in the last year of the study. The statistical significance of this trend suggests that the observed changes are unlikely to be due to random variation and may reflect underlying shifts in the epidemiological profile of the city's population.

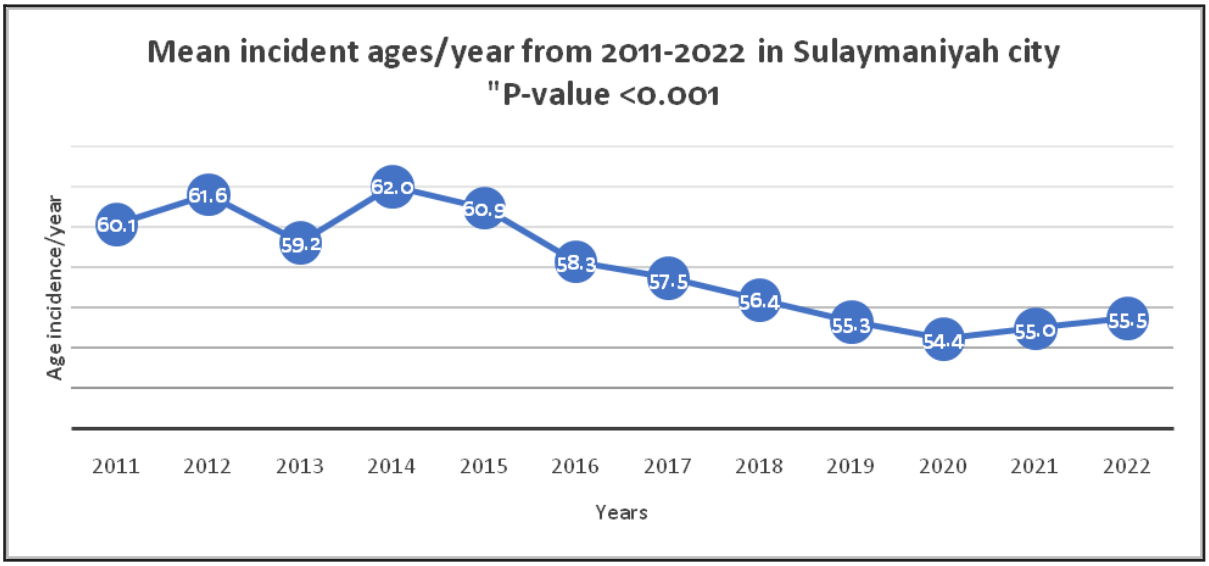

Figure 2 breast cancer's mean incident age over the last 12 years

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Colorectal cancer incidence age in Sulaymaniyah city over 12 years demonstrates a statistically significant downward trend (*P*-value <0.001). The mean incidence age began at 67.9 years in 2011, which was the peak age throughout the study timeline. A marked decrease was noted in the following year, with the mean age dropping to 63.1 years in 2012. The subsequent year, 2013, showed a further decrease to a mean age of 59.4 years.

After this point, the mean incidence age displayed minor fluctuations but maintained a general downward trajectory. The years 2014 and 2015 recorded mean ages of 62.0 and 61.0 years, respectively, followed by a noticeable decline to 58.3 years in 2016. From 2017 onwards, the mean incidence age consistently decreased each year, reaching 57.5 years in 2017, 56.5 years in 2018, and continuing to 55.2 years in 2019.

The last three years of the study period showed a slight plateauing effect, with the mean incidence age being 54.4 years in 2020, marginally reducing to 55.0 years in 2021, and then slightly increasing to 55.5 years in 2022. (Figure 3)

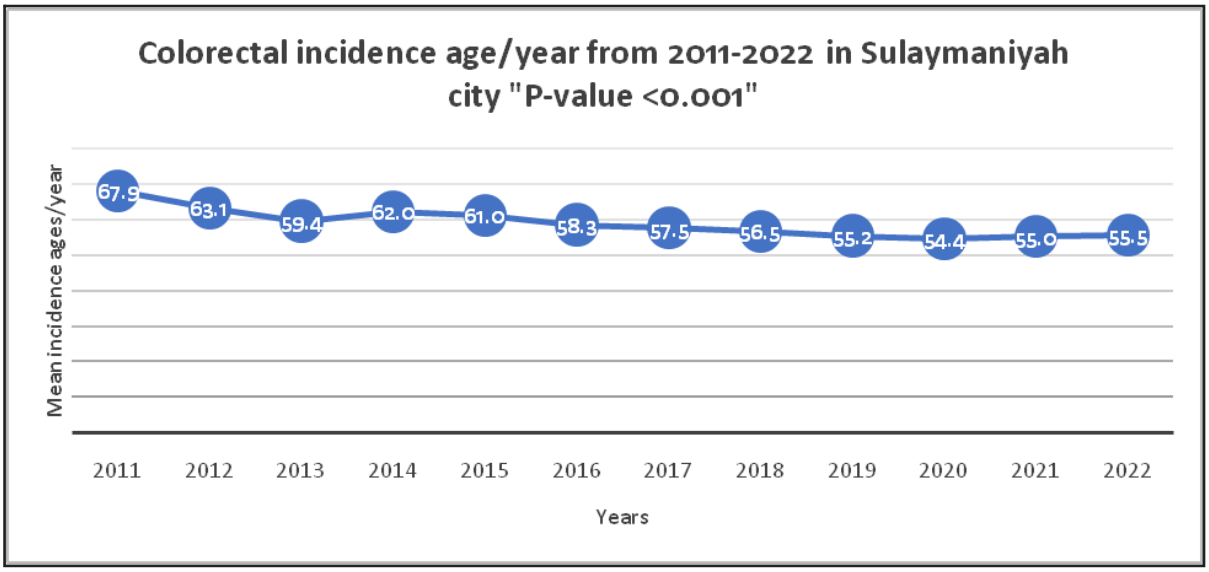

Figure 3 Colorectal cancer's mean incident age over the last 12 years

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lung cancer incidence age in Sulaymaniyah city has shown a significant decreasing trend over the observed 12-year period (*P*-value <0.001). The mean incidence age commenced at 62.9 years in 2011. It then exhibited a notable decrease to 59.5 years in 2012. The trend appeared to reverse slightly in 2013, increasing to a mean incidence age of 62.1 years.

A subsequent decrease was observed in 2014, with the mean incidence age dropping to 61.1 years, followed by a more substantial decline to 58.5 years in 2015. This downward trend continued, with the mean incidence age reaching 57.5 years in 2017. Over the next few years, the mean incidence age for lung cancer stabilized slightly, with 56.5 years in 2018, 55.2 years in 2019, and a slight drop to 54.6 years in 2020.

The data in 2021 indicated a marginal increase in the mean incidence age to 54.9 years. However, in 2022, the age once again slightly increased to 55.5 years. (Figure 4)

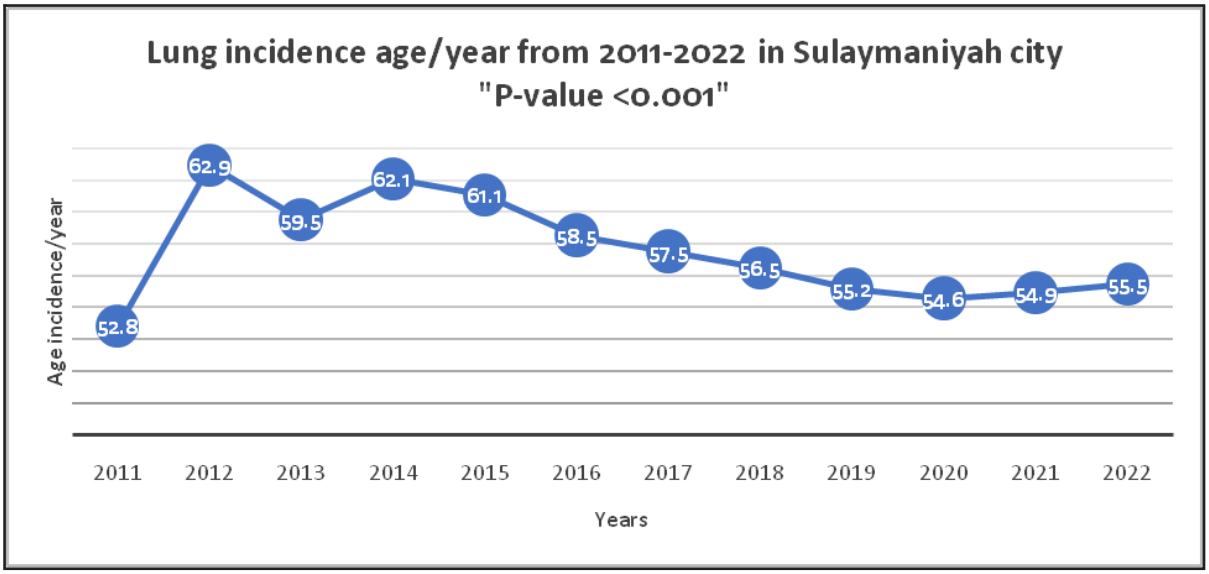

Figure 4 Lung cancer's mean incident age over the last 12 years

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A statistically significant decline in the mean incidence age of cervical cancer in Sulaymaniyah City was observed over the 12 years, as indicated by a *P*-value <0.001. The mean incidence age in 2011 was 58.8 years, which initially increased to 62.1 years in 2012. The year 2013 saw a slight decrease to 59.2 years, followed by a return to a peak of 62.0 years in 2014.

From 2014 onwards, there was a consistent downward trend. The mean incidence age decreased to 60.9 years in 2015 and further declined to 58.9 years in 2016. A more pronounced decrease was noted in the subsequent years, with the mean incidence age reaching 57.5 years in 2017 and then 56.5 years in 2018.

The trend continued, with the mean incidence age falling to 55.1 years in 2019. The most substantial decrease was observed between 2019 and 2020, with the mean incidence age dropping to 53.9 years. However, in the final two years of the study, the mean incidence age slightly increased, recording 54.9 years in 2021 and 55.2 years in 2022. (Figure 5)

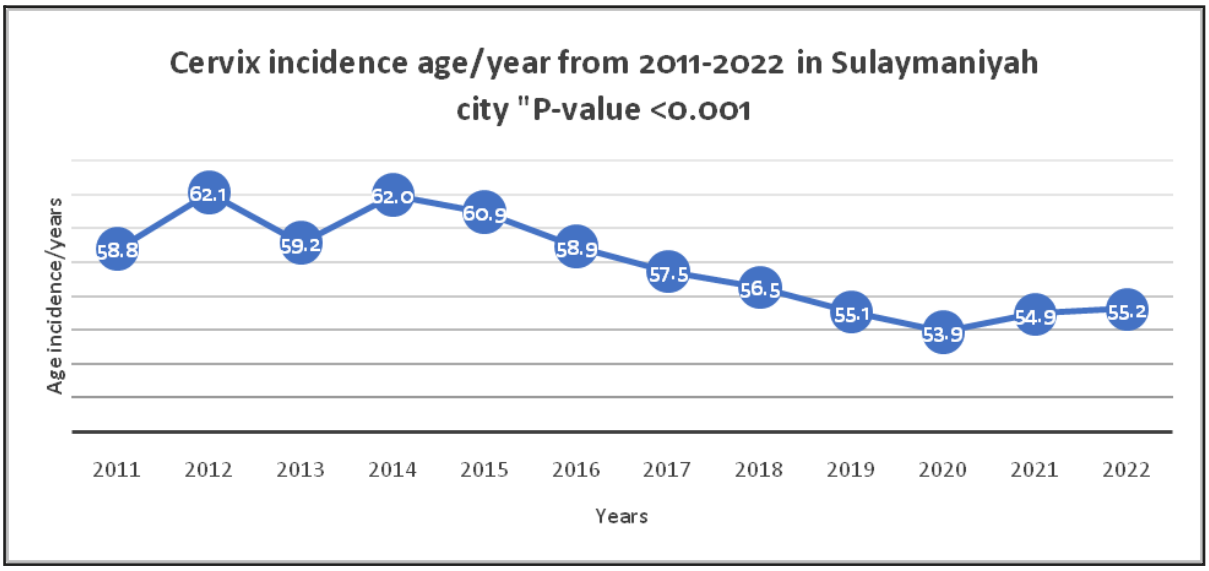

Figure 5 Cervical cancer's mean incident age over the last 12 years

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prostate cancer incidence age in Sulaymaniyah city shows a statistically significant downward trend over the 12 years, with a *P*-value <0.001. The mean incidence age started at 79.7 years in 2011, which was substantially higher than any subsequent year in the study period. There was a dramatic decrease to 63.0 years in 2012.

Following this initial drop, the mean incidence age fluctuated slightly but generally continued to decrease. It was 59.6 years in 2013, with a small increase to 62.1 years in 2014. The following years showed a steady decline: 61.1 years in 2015, 58.6 years in 2016, and a further decrease to 57.5 years in 2017.

This downward trend persisted, with the mean incidence age reaching 56.6 years in 2018, 55.2 years in 2019, and continuing to decrease to 54.4 years in 2020. In 2021, the mean incidence age was 55.0 years, and in 2022, it exhibited a slight increase to 55.5 years. (Figure 6)

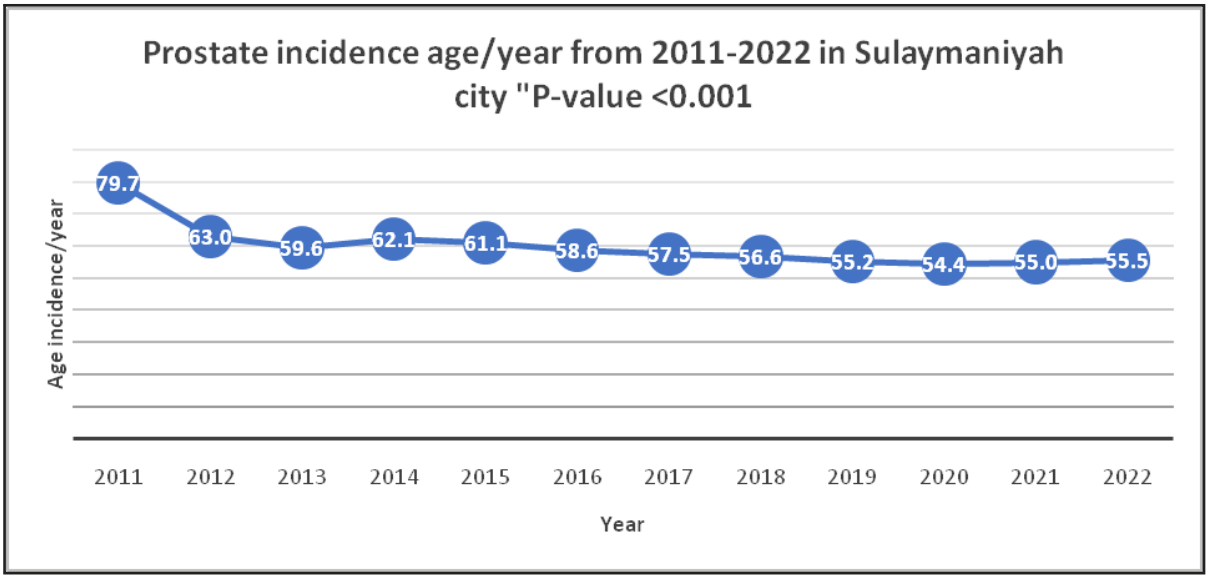

Figure 6 Prostatic cancer's mean incident age over the last 12 years

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Discussion

The findings from Sulaymaniyah city reveal a distinct downward trend in the mean incident ages for breast, colorectal, lung, prostate, and cervical cancers over the last 12 years[2,5].These findings agree with the idea that these tumors are appearing in younger folks from this specific city area. The big importance level (*P*-value less than 0.001) in these changes show that they likely aren't just random highs and lows but instead suggest a change or shift in what causes illnesses to happen more often nowadays.(7)

When placed side by side with info from rich developed countries and nearby places like Turkey, Iran, Jordon, Israel, Lebanon Saudi Arabia and Kuwait various points become clear. Big countries have a history of reporting more cases of cancer that can be found by tests in older ages. This is usually because they check people better for the disease and understand it fully.(8) However, a pattern similar to Sulaymaniyah's is emerging in these nations, with studies reporting a gradual shift toward younger ages of incidence, particularly in colorectal and breast cancers. For instance, recent literature from the United States and the European Union has noted a trend of these cancers occurring at younger ages, although the mean ages remain older than those observed in Sulaymaniyah.(9)

On the other hand, Sulaymaniyah's nearby areas have a mixed view. For example, information from Iran and Turkey shows slightly higher average case ages for breast and colorectal cancers than in Sulaymaniyah. This might show differences in people's groups, life actions and health care reaching. The changes in Sulaymaniyah might be affected by special environmental factors or genetic tendencies that need more study.(2,10)

The decline in the mean incident age for prostate cancer is particularly noteworthy. While the initial year of the study showed a remarkably high mean incident age, it is possible that this was an outlier or reflective of under-diagnosis in earlier years. The subsequent decline aligns with global observations, although Sulaymaniyah's mean incident ages are now lower than those reported in many developed countries. This warrants an examination of prostate cancer screening and diagnostic practices in Sulaymaniyah, as changes in these could impact observed incidence ages.(11,12)

The age at which people started getting cervical and lung cancers went down too. This is a worry because these cancers are linked with things you can change, like smoking and HPV infection. In Sulaymaniyah, it might be necessary that public health projects increase their efforts to deal with these factors more seriously. This becomes important knowing that the typical ages when people get sick from these cancers in nearby countries stay about same right now.(13)

These results have many effects. This change towards seeing the problem in younger people means we need to look again at screening rules. These are usually meant for older folks. Also, healthcare help might need to be moved around to take care of young patients better. This includes thinking about long-term survival support too.(14,15)

Conclusion

Epidemiological Shift: There is a clear trend of screenable cancers presenting at earlier ages in Sulaymaniyah city, with implications for clinical practice and public health policy.

Comparison with Regional Data: While Sulaymaniyah's trends are consistent with global observations, there are notable differences when compared with regional data, indicating the influence of local factors.

Public Health Implications: The findings underscore the need to reassess current screening guidelines, potentially lowering the recommended ages for cancer screening to reflect the younger demographic at risk.

Healthcare System Response: Cancer care might have to change how it helps kids by meeting their needs. This includes thinking about what they need for health in the coming years and living well.

Call for Further Research: We need to keep studying why this change is happening. It will help us understand things like genes, environment and lifestyle that might be causing it as well looking at how good our current checking methods are working now.

Policy Considerations: People in charge of making rules should take these results into account when thinking about health care planning and ways to prevent cancer. They need to focus on finding cancers early and changing things that might cause them.

Competing interests

The author declares that he has no competing interests.

References

1. Hussain AM, Lafta RK. Cancer Trends in Iraq 2000-2016 Oman Med J. 2021; 36(1):e219. doi: 10.5001/omj.2021.18
2. Khoshnaw N, Mohammed HA, Abdullah DA. Patterns of Cancer in Kurdistan - Results of Eight Years Cancer Registration in Sulaymaniyah Province-Kurdistan-Iraq. Asian Pac J Cancer Prev. 2015; 16(18):8525-31. doi: 10.7314/apjcp.2015.16.18.8525
3. Shao Q, Tao R, Luca MM. The Effect of Urbanization on Health Care Expenditure: Evidence From China. Front Public Health. 2022; 10:850872. doi: 10.3389/fpubh.2022.850872
4. Roshandel G, Ferlay J, Semnani S, Fazel A, Naeimi-Tabiei M, Ashaari M, et al. Recent cancer incidence trends and short-term predictions in Golestan, Iran 2004-2025 Cancer Epidemiol. 2020; 67:101728. doi: 10.1016/j.canep.2020.101728
5. K MA, Abdullah OS, Amin AMS, Mohamed ZA, Hasan B, Shekha M, et al. Cancer Incidence in the Kurdistan Region of Iraq: Results of a Seven-Year Cancer Registration in Erbil and Duhok Governorates. Asian Pac J Cancer Prev. 2022; 23(2):601-15.doi: 10.31557/APJCP.2022.23.2.601
6. Wang K, Liu Y, Mashrur SM, Loa P, Habib KN. COVid-19 influenced households' Interrupted Travel Schedules (COVHITS) survey: Lessons from the fall 2020 cycle. Transp Policy (Oxf). 2021; 112:43-62.doi: 10.1016/j.tranpol.2021.08.009
7. Collaborators GBDAYAC. The global burden of adolescent and young adult cancer in 2019: a systematic analysis for the Global Burden of Disease Study 2019. Lancet Oncol. 2022; 23 (1):27-52. doi: 10.1016/S1470-2045(21)00581-7
8. Vierboom YC, Preston SH, Hendi AS. Rising geographic inequality in mortality in the United States. SSM Popul Health. 2019; 9:100478. doi: 10.1016/j.ssmph.2019.100478
9. da Costa Vieira RA, Biller G, Uemura G, Ruiz CA, Curado MP. Breast cancer screening in developing countries. Clinics (Sao Paulo). 2017; 72(4):244-53. doi: 10.6061/clinics/2017(04)09
10. 33rd Annual Meeting & Pre-Conference Programs of the Society for Immunotherapy of Cancer (SITC 2018) : Washington, D.C., USA. 7-11 November 2018. J Immunother Cancer. 2018; 6(Suppl 1):115. doi: 10.1186/s40425-018-0423-x
11. Azamjah N, Soltan-Zadeh Y, Zayeri F. Global Trend of Breast Cancer Mortality Rate: A 25-Year Study. Asian Pac J Cancer Prev. 2019; 20(7):2015-20. doi: 10.31557/APJCP.2019.20.7.2015
12. Stojan G, Petri M. Epidemiology of systemic lupus erythematosus: an update. Curr Opin Rheumatol. 2018; 30(2):144-50. doi: 10.1097/BOR.0000000000000480
13. Okunade KS. Human papillomavirus and cervical cancer. J Obstet Gynaecol. 2020; 40(5):602-8. doi: 10.1080/01443615.2019.1634030
14. Menassa M, Stronks K, Khatmi F, Roa Diaz ZM, Espinola OP, Gamba M, et al. Concepts and definitions of healthy ageing: a systematic review and synthesis of theoretical models. E Clinical Medicine. 2023; 56:101821. doi: 10.1016/j.eclinm.2022.101821
15. Kocarnik JM, Compton K, Dean FE, Fu W, Gaw BL, et al. Cancer Incidence, Mortality, Years of Life Lost, Years Lived With Disability, and Disability-Adjusted Life Years for 29 Cancer Groups From 2010 to 2019: A Systematic Analysis for the Global Burden of Disease Study 2019. JAMA Oncol. 2022; 8(3):420-44. doi: 10.1001/jamaoncol.2021.6987