A COMPREHENSIVE ANALYSIS OF GLOBAL SKIN CANCER INCIDENCE & MORTALITY, WITH A FOCUS ON DERMATOLOGIST DENSITY & POPULATION RISK FACTORS

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INTRODUCTION

Melanoma and Non-Melanoma Skin Cancers (NMSC), such as Squamous Cell Carcinoma (SCC), Basal Cell carcinoma (BCC), and Merkel Cell Carcinoma (MCC), and Kaposi Sarcoma (KS), pose a global health burden. This study assesses global skin cancer epidemiology, emphasising incidence, mortality, risk profiles, and dermatologist density's impact.

MATERIAL & METHODS

Using WHO International Agency for Research on Cancer (IARC) data, we conducted an epidemiological analysis of skin cancer. Our study focused on the worldwide distribution of skin cancer and examined the correlation between dermatologist density and mortality-to-incidence ratios. By mapping one relative to the other, we developed an indicator to assess healthcare system efficiency in managing melanoma. We also examined skin cancer risk increase in immunocompromised individuals, individuals with genodermatosis (xeroderma pigmentosum (XP) and albinism), the elderly (65+), outdoor workers, individuals with indoor tanning practices, and by skin colour.

RESULTS

In 2020, global skin cancer incidence was 1,522,708, resulting in 120,774 deaths. Europe carries the heaviest burden, with 506K cases and 39,039 deaths. Africa had the highest mortality-to-incidence ratio (0.33 vs 0.02 for North America), indicating a higher probability of melanoma-related mortality (*Figure 1*).

NMSC, despite lower mortality likelihood, led to 63,731 deaths in 2020 due to significantly higher incidence. The data clearly showed an issue about a non-uniform under-reporting of NMSC incidence with (for example) 1 death every 709 cases in the US vs 1 every 28 in Europe and 1 every 3 in Asia. Even countries with a high proportion of dark phototypes are not immune to the risk of death from skin cancer, as demonstrated by the registered 11,281 deaths in Africa. Among 59 countries with data, dermatologist densities varied widely (0.33 per 100K in Pakistan to 15.15 in Greece), with no linear correlation to wealth or melanoma incidence.

Mapping revealed high skin cancer incidence in countries with fair-skinned and elderly populations: USA, Germany, UK, France, Australia, and Italy (*Figure 2*). Conversely, low dermatologist density countries (India, China, Turkey, Korea, Morocco) showed higher mortality-to-incidence ratios. Japan, Russia, and Argentina had high ratios despite high dermatologist density.

Figure 1: Worldwide skin cancer incidence and mortality

Continents	Population Size	Mortality		Incidence		Mortality to Incidence Ratio
		Total Mortality	Mortality per 100k	Total Incidence	Incidence per 100k	
Oceania	42,677,809	3,184	7.4	89,161	208.91	0.035
Europe	746,225,356	39,039	5.3	506,807	67.91	0.077
LATAM	438,516,244	13,722	3.1	90,200	20.56	0.152
North America	592,072,212	13,797	2.3	691,747	116.83	0.019
Asia	4,641,054,786	39,751	0.8	110,793	2.38	0.358
Africa	1,340,598,113	11,281	0.8	34,000	2.53	0.331

Figure 2: Melanoma incidence rate per 100K vs. dermatologist count per 100K

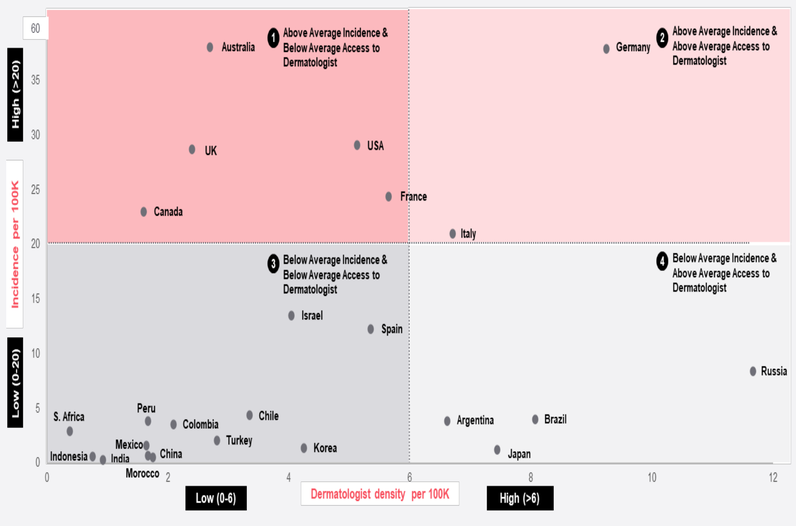

Figure 3: Melanoma mortality-to-incidence ratio vs. dermatologist count per 100K

Australia, the UK, and Canada maintained low ratios despite fewer dermatologists (*Figure 3*). Key melanoma 'at risk' populations are the elderly (RR: 8.5); organ transplant recipients (RR: 8); fair skin (RR: 5.7); and XP (RR: 2,000). Outdoor workers face a higher risk of NMSC compared to Melanoma.

CONCLUSION

Our findings emphasise the need for enhanced melanoma awareness, early detection, and patient education, especially in vulnerable populations and countries with high mortality-to-incidence ratios. Australia, UK, and Canada demonstrate a different approach to skin cancer management, with lower ratios despite fewer dermatologists. Early detection campaigns, specialised training for non-dermatologist healthcare professionals, healthcare structures focused on skin cancer and high-tech diagnostic tools, may partially explain this success. Education on photoprotection and early access to healthcare professionals for at-risk groups (fair-skinned, the elderly, immunosuppressed, and genodermatosis patients) are crucial for improving melanoma survival. NMSC, with increasing incidence and substantial mortality, requires improved surveillance through national registries. Further investigations are necessary to identify factors contributing to effective skin cancer management in specific countries.

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