Letter to Editor

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A Life-Course Lens for Etiology and Prevention of Gastric Cancer

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ABSTRACT

Gastric cancer (GC) remains a significant public health challenge in many low- and middle-income countries, particularly Iran. Despite advances in medical care and public health infrastructure, GC incidence among older adults continues to be alarmingly high. While much research has focused on adult risk factors—such as red meat consumption, smoking, alcohol intake, and Helicobacter pylori infection—emerging evidence suggests that the roots of GC extend far deeper, often tracing back to early-life conditions. Hadji M. and her colleagues published a case-control study in Iran in the current issue of Basic and Clinical Cancer Research (BCCR). They highlighted the profound influence of childhood socioeconomic factors on cancer risk decades later [1].

This study underscores the importance of adopting a life-course approach to understanding GC etiology and prevention, especially in countries like Iran. One of the most striking findings was the nearly threefold increased risk of GC associated with lack of access to clean tap water during childhood. This finding elevates sanitation from a developmental concern to a critical long-term cancer risk factor. It reflects the biological reality that early-life exposures—nutritional deprivation, microbial infections, poor housing, and inadequate hygiene—can cast a long shadow over lifelong health.

Older generations in Iran experienced vastly different living conditions compared to today's youth. Four to five decades ago, access to clean water and refrigeration was limited, particularly in rural and underserved urban areas. Children were frequently exposed to untreated water, a key transmission route for pathogens, including H. pylori [2]. Although infection rates remain high in some regions, national infrastructure improvements have dramatically increased access to electricity, clean water, and refrigeration. These changes have reduced infection rates and improved nutrition, yet the epidemiological consequences of past deprivation persist.

The cohorts most affected by early-life disadvantage are now entering their 50s, 60s, and 70s—the age groups at highest risk for GC. Waiting passively for socioeconomic development to reduce GC incidence is both ethically and practically inadequate. It would mean neglecting a large population currently at elevated risk due to conditions endured decades ago: lack of sanitation, refrigeration, healthcare access,

and exposure to childhood infections and malnutrition. To reduce GC incidence and mortality today, we must acknowledge these historical inequities and respond proactively.

Interestingly, our study also found no significant association between GC and behaviors such as cigarette smoking, opium use, and alcohol consumption. While these are established risk factors in many contexts [3], the lack of significance here may reflect changing substance use patterns, cultural stigma leading to underreporting, or limited sample size. It also suggests that among older Iranian adults, early-life exposures and long-term dietary habits may outweigh midlife behaviors in determining GC risk.

Geographic disparities within Iran further complicate the picture. Cancer registries reveal stark variations in GC incidence—from over 20 per 100,000 in northern provinces to under five per 100,000 in southern ones [4]. These disparities closely mirror economic development and infrastructure access and will not resolve without tailored, region-specific policies. Although universal access to clean water and electricity has largely been achieved, the legacy of unequal development endures.

The most immediate and cost-effective approach is targeted screening and intervention for older adults who experienced deprived childhood conditions. Outreach programs can identify individuals born in high-risk regions or those reporting limited access to sanitation, refrigeration, and clean water during childhood. These individuals may benefit from endoscopic screening, nutritional counseling, and ongoing clinical monitoring. Concurrently, education campaigns should highlight the lifelong importance of proper nutrition and hygiene, encouraging fruit and vegetable consumption, safe water use, and adequate food storage. Primary care providers should incorporate questions about early-life environmental factors—such as water source, household amenities, and parental occupation—into routine assessments to better stratify gastric cancer risk.

In summary, the paper emphasizes that childhood conditions significantly influence adult cancer risk, urging a shift in prevention strategies from midlife interventions to a comprehensive life-course approach starting at birth. For countries like Iran, undergoing health transitions, addressing historical disparities, and accelerating targeted interventions is crucial to effective cancer prevention. Future research priorities include long-term cohort studies to clarify early-life exposures, geospatial mapping to link socioeconomic factors with cancer patterns, and community-based nutritional and screening interventions for high-risk groups to enhance our understanding of the etiology and improve equitable prevention of gastric cancer in Iran and other high-risk countries.

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