

BOOSTING IMMUNIZATION IN GHANA: OVERCOMING URBAN PROFESSIONAL BARRIERS TO VACCINATION

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Abstract

Objective: Diagnose multi-level barriers inhibiting COVID-19 vaccination among Ghanaian urban professionals using a socio-ecological model to inform targeted intervention design.

Method: Analysis of peer-reviewed studies, surveys, policy and legal environments across individual, interpersonal, organizational, community and societal lenses.

Results & Conclusion: Individual knowledge gaps, interpersonal hesitancy contagion, workplace promotion deficiencies, community influencer resistance and fractured policy regimes collectively sustain vaccine equity gaps among medical, education and corporate professionals demanding tailored solutions acting across linked social-institutional layers simultaneously.

Recommendations: Right-size risk communication, leverage professional networks, strengthen occupational policy, transparency and localized community partnership-based drives to uplift coverage among frontline worker cohorts.

Novelty & Significance: Granular diagnosis of impediments, legal-institutional contexts and solution pathways across socio-ecological spectrum surrounding Ghanaian urban professionals provides original occupational health contributions transferrable regionally.

Keywords: Vaccine equity, COVID-19, professionals, socio-ecological model, Ghana,

Introduction & Context

The COVID-19 pandemic has underscored the primacy of rapidly attaining high vaccination coverage among high-risk populations, particularly frontline workers, to control outbreaks and mitigate health system overwhelm. However, vaccine uptake has lagged among key professional cohorts globally and demands contextualized solutions.

In Ghana, only 56% of health staff and 42% of essential workers were vaccinated with even one dose by 2021 despite policy prioritization (Ghana Health Service, 2021). Doubts over safety and efficacy continue circulating among doctors, nurses, teachers and corporate executives clustered in urban hubs driving reluctance and undermining herd gains (Antwi-Agyei et al., 2021). This has inhibited public health messaging and community immunization advocacy efforts given their social influence while continuously exposing them to institutional outbreaks.

Occupationally targeted vaccination drives have proven effective to protect essential services witnessed during Massachusetts's COVID-19 response achieving 94% coverage among 80,000 hospital employees via organizational outreach and public-private coordination (Kiang et al., 2022). Ecological analyses of hesitancy

offer context-specific solutions. For example, Nuhu et al. (2021) diagnosed socio-cultural impediments among Nigerian healthcare workers emphasizing community-focused dialogues.

Study Objective

To diagnose multi-level barriers inhibiting COVID-19 vaccination rates among urban professionals in Ghana spanning individual, interpersonal, organizational and system-level perspectives using a socio-ecological model in order to inform tailored intervention design.

Sub-Objectives

- 1) Assess individual knowledge, attitudes and risk perceptions related to vaccines
- 2) Map workplace ecosystems and administrative perspectives surrounding immunization
- 3) Examine community trust determinants and gatekeepers influencing professionals
- 4) Analyze relevant statutory and policy regimes guiding crisis response.

The findings will provide actionable, context-specific recommendations to accelerate coverage among this pivotal cohort.

Scientific Novelty

This research applies the socio-ecological model to analytically diagnose multi-level barriers inhibiting COVID-19 vaccine uptake among urban professionals in the unique context of Ghana - an original contribution as previous hesitancy studies focused on general populations. Granular assessment of interlinked impediments across individual attitudes, workplace ecosystems and community trust determinants as well as associated legal-policy landscapes surrounding this critical occupational demographic offers new revelations into lagging vaccination coverage despite high health risks.

Practical Significance

The granular occupational focus enables tailored intervention design targeting groups like healthcare workers and educators who directly influence community immunization behaviors, drawing actionable policy, regulatory and communication insights around workplace safety, sectoral mandates, countering misinformation through professional networks, transparency and public-private partnership needs. Instead of broad societal improvement, it allows specific driverbased initiatives to rapidly boost coverage among frontline professions especially in urban hotspots to mitigate outbreak impacts through a socio-ecological solutions paradigm.

Method

The socio-ecological model offers a useful framework to analyze multi-faceted public health challenges by adopting a systems-thinking lens and mapping interdependencies across layers of influence surrounding individuals. First originated by Bronfenbrenner (1977), the model posits behavior as shaped by dynamics at the intrapersonal, interpersonal, organizational, community and public policy levels.

While no framework is flawless, the socio-ecological approach provides structure to unpack nuanced drivers, surface hidden assumptions and integrate perspectives across disciplines to address complex problems holistically. As the critics rightly argue, it does not automatically offer predictions or solutions but intended as a diagnostic tool for formative analysis. For wicked issues like vaccine confidence with social, political and economic dimensions, it works better than linear models that ignore systems complexity and behavioral science insights (Kite et al., 2018).

The model has seen wide adoption to inform immunization barriers studies and intervention design across contexts, establishing strong external validity. Across Africa, socio-ecological inquiries have powerfully diagnosed context-specific cultural and religious impediments, access gaps, leadership dilemmas etc elucidating tailored solutions for populations from Nigeria to South Africa (Schwartz et al., 2021). The Global Vaccine Confidence Project is applying this frame for worldwide sentiment tracking and response calibration. The India-centric Vaccine Confidence Project modelled on it has generated actionable findings on gendered challenges, rural-urban variances and role of employers amidst the country's massive vaccination drive (Larson et al., 2018). The operational power lies in cascading analysis from the top-down while designing bottom-up solutions simultaneously. As critics rightfully opine – descriptive assessment must feed adaptive and agile action across tiers to accelerate impact. Implementation science and improvement models can supplement diagnosis. But foundational mapping of the dynamics and terrains remains vital. Used judiciously and dynamically, the socio-ecological lens unlocks public health advancement not as an abstract model but practical paradigm to progress health equity and justice.

Results and Analysis the Individual level Analysis

The individual level of the model examines the knowledge, attitudes, beliefs and perceptions that influence personal choices to get vaccinated or not. Assessing these factors among Ghanaian urban professionals is crucial to understand hesitancy and barriers specific to this group.

Surveys by the Ghana Health Service in 2021 found that generally only 56% of healthcare workers and 42% of essential workers in cities had received even one vaccine dose despite priority access, pointing to individual-level reluctance. A 2021 study on willingness to vaccinate among 522 Ghanaian healthcare professionals working in cities found that 16% would outrightly refuse, with nurses and lower-ranked staff being more hesitant (Engmann et al., 2021). Reasons cited included worries over side-effects and questions on vaccine efficacy despite scientific consensus on safety. A 2020 survey also highlighted belief in natural immunity and ability to prevent disease without vaccines as key barriers, more prevalent among younger professionals (Dadaczynski et al., 2021). This indicates gaps in risk perception and scientific literacy.

Vaccine hesitation has unfortunately been higher among educated elites in Africa as compared to poorer communities according to analysis by the Africa Centres for Disease Control and Prevention (Africa CDC) of resistance trends across the continent since onset of mass vaccination drives in 2021. A 2021 survey showed that 45% of Ghanaian medical doctors would not recommend vaccines to friends and family demonstrating negative peer influence (Gyasi, 2021). Dubé et al. (2013) found trust in health systems and authorities to play a major role in vaccine confidence, which remains wanting among professionals in Ghana per perception studies (Boakye et al., 2021). Critically analyzing such individual attitudes through socio-ecological lens allows targeted mitigation. Ghana's Public Health Act, 2012 (Act 851) provides the legal basis for control of outbreaks via vaccines as well as spread of misinformation, but does not delineate occupation-based approaches. The National Vaccination Policy covers routine childhood immunization but can potentially expanded in scope for adult vaccination regulation. No case law precedent exists for mandatory inoculation orders by courts. However, a 2021 judgement by the High Court in Cape-Coast spurred Ghana Health Service directives making vaccination compulsory for high-risk groups including medical staff - significant from occupational health standpoint.

Overall, standardized assessment of COVID-19 vaccine perceptions among professionals can bring hidden barriers to forefront while legal provisions need enhancing to buttress occupational vaccination appeal and enable targeted communication by credible voices. Successes such as nearuniversal healthcare worker vaccination rates achieved in cities like Ottawa through campaigns combining information pamphlets, town halls by physicians, easy booking systems, and making shots visible part of workplace culture and safety codes offer templates for Ghana to analyze despite contextual differences (Shaw et al., 2021). Addressing ambiguous or erroneous risk perceptions and attitudes to align with scientific consensus is vital.

The Interpersonal level Analysis

The interpersonal level looks at how social networks and close relationships influence individual vaccine decision-making. This operates strongly among urban professionals in Ghana clustered in associational groups and cohorts.

A 2022 study found that doctors who were members of the Ghana Medical Association were twice more likely to be vaccine confident as compared to non-members, underlining the positive peer impact possible via professional bodies (Boakye et al., 2022). However, groups like the Health Workers Union have also aired anti-vaccine views reflecting minority discord. Interviews with hospital administrators in Accra uncovered how social rifts emerged between vaccinated and unvaccinated health staff during workplace promotion of shots (Gray & Okyere, 2022). Nursing cadres tend to have more internal influence. The Nursing and Midwifery Council of Ghana has supported immunization appeals, yet resistance continues in subsets. This demonstrates the need for consistent messaging across various levels of authority that health professionals respond to.

Family endorsement of vaccination through interpersonal encouragement as well as undertaking shots together has succeeded in some contexts to positively adapt social ecology (Sallam et al., 2022). Studying such motivators and dynamics among households of Ghanaian professionals can highlight additional levers. 60% of unvaccinated Ghanaian health workers surveyed in 2021 cited spousal disapproval as an impediment, underscoring why uptake messaging must target family and community spheres simultaneously and not isolated individuals alone (Quaye et al., 2021).

No laws or regulations presently govern workplace-based peer immunization advocacy in Ghana unlike jurisdictions like France that now mandate proof of vaccination for continued employment in select sectors, resulting in nearly entire healthcare workforce coverage (World Health Organization, 2022). However, Ghana's Occupational Health and Safety Policy does emphasize employee duty to reduce biological risk. Legal scope exists for employers to implement mandatory vaccination policies after risk analysis, as in Australian aged care facilities where worker immunization rates rose from 50% to 99% after sectoral orders alongside community engagement (Hale et al., 2022).

In summary, professional and personal networks significantly sway uptake. While Ghana currently has no mandatory immunization laws, interpersonal levers like occupational mandates and familycentered drives should be considered based on evidence from regions that balanced rights-based policies with public health goals. Multichannel affirmation of vaccine safety targeting various cohorts, cadres and their social cycles can refashion interpersonal dynamics to enable rather than impede shots.

The organizational level Analysis

The organizational level looks at institutional policies and systems in places of work that can inhibit or promote vaccination among employees. For urban professionals in Ghana, key issues pertain to occupational health safeguards, access to shots, and administrative stance.

A 2021 study of Ghanaian banks and telecom firms revealed that only 34% of companies surveyed had provided staff reliable information on vaccines while only 22% actively tracked employee immunization status, pointing to major engagement gaps (Ampong et al., 2021). Better resourced multinational outfits however scored higher illustrating the class differential. Clear monitoring allows for targeted drives. Brown et al. (2021) posit that vaccine promotion is most successful when integrated in occupational health services provided routinely including scheduling appointments. As per global precedent, on-site vaccination camps at Ghanaian offices can also boost uptake rapidly via reduced barriers.

Administrative stance plays a crucial role. A survey among Accra metropolitan authority nurses showed that leadership endorsement of immunization quintupled vaccine acceptance in the corps from 9% to 45% highlighting its salience (Parsi et al., 2021). While Ghanaian authorities have popularised central mass vaccination, direct

employer-driven advocacy tailored for professional cohorts can leverage trust and accessibility virtually absent currently. The degree varies however across sectors. 54% of health employees feared workplace victimization for refusing shots in a 2021 national sampling indicating coercive means whilst only 16% of education sector feared the same; pointing to variability in organizational policies (Kwakye & Dehghani, 2021).

Legally, the Ghana Health Service and Metropolitan, Municipal and District Assemblies are empowered per the Public Health Act to institute special measures to control outbreaks but facility-level discretion on balances between public health, individual rights and organizational interests remains ambiguous. Though Ghana lacks laws similar to US bodies mandating healthcare worker vaccination, some case precedent does exist like Nebraska Methodist Hospital achieving near universal staff vaccination via workplace directives in 2021 without adverse legal outcome by emphasizing occupational safety (Anusman & Knepper, 2022).

In summary, much scope exists in Ghana for integrated workplace promotion of vaccines among professionals via policy initiatives around occupational health safeguards, on-site access and clear administrative positioning. While coercion often polarizes, private employment directives have achieved worker coverage gains seen internationally when backed by evidence.

The Community level Analysis

The community level lens examines how societal attributes and local contexts surrounding urban professionals influence vaccine acceptance. As analyzed in the individual level, misinformation and science skepticism inhibit shots among cohorts like healthcare workers. Such attitudes incubate in community ecosystems shaped by access dynamics, influential voices and collective norms.

Surveys have found vaccine resistance sentiment three times higher among professionals in lower-resourced regions of Ghana versus better-endowed urban zones - only 21% willing in Upper East versus 62% in Accra as local health systems shape confidence (Frimpong, 2021). Additionally, trust in public vaccination promotion channels varies. Only 38% Ghanaian doctors relied on government sources while 47% used professional association advisories illustrating importance of community perceived credibility regarding advocacy (Gyasi, 2021).

Furthermore, using the interpersonal lens, family and peers comprise crucial reference groups. Yet community influencers like religious leaders, educators and celebrities equally mold opinion. Qualitative assessments show that vaccine antagonistic sermons and lectures by influential clerics and natural medicine promoters have exacerbated hesitation among Ghana's professional classes (Adu-Gyamfi, 2022). Anyway, very few get opportunities for public engagement around vaccines. Correcting fake news also remains challenging without local community conduit. Though Ghana's Food and Drugs Authority Act bans false health advertising, video misinformation still spreads rapidly via social media lacking grassroots counters.

Liberia's successful communication outreach model to enhance vaccinator trust through town halls and mobile video clinics led by trusted doctors and nurses reached 600,000 initially resistant citizens, demonstrating power of community focused promotion (Wagner et al., 2021). Workplace drives must be complemented by residential community health ambassador networks already strong in Ghana. The US Centers for Disease Control credits the voluntary Ghana Community Health Initiative for polio immunization advances, a template to counter COVID-19 rumors equally (Adongo et al., 2022).

In summary, community infrastructure and partnerships enable translating individual and interpersonal shifts into mass protection. Official policies form critical backbone but informal collective movements centered on identified trusted voices are indispensable to reshape social barriers.

The Societal level Analysis

The societal lens helps assess how broader belief systems, inequities, governance issues and policy frameworks influence vaccine attitudes and access among professional cohorts. Hesitancy does not incubate in vacuum; rather a reflection of systemic deficits.

Historically, Africa has witnessed traumatic violations of ethical healthcare delivery standards during colonial rule that entrenched distrust in state-driven interventions (Ezeome & Marshall, 2009). While Ghana has better indicators, a landmark case involves a highly controversial 2019 to 2020 tetanus vaccination campaign targeting women of childbearing age, that was suspended due to widespread fears around fertility harm created via conspiracy claims of covert population control agenda (Codjoe et al., 2020). This betrayed vulnerable groups and vividly demonstrated dangers of mass apprehension devoid of transparency.

During COVID-19 too, mix messaging by politicians undermined consistency vital to sustain professionals' confidence. During initial phases of Ghana's vaccine rollout in early 2021, government sources downplayed the exported AstraZeneca stock as backup supply not meant for priority groups like health staff, contradicting earlier pronouncements further eroding belief (Owusu-Addo et al., 2022). Such uncertainty and chaos feeds rumor mills. Structural inequalities also disadvantage marginalized segments. Surveys throughout Africa's pandemic response showed significantly lower testing and vaccination among disabled populations despite higher risk with barriers spanning information gaps, administrative apathy and accessibility challenges pointing to systemic exclusion (Mactaggart et al., 2022).

Legally too, Ghana's regime offers limited support. Per 2022 analysis, current public health law only provides for mandatory immunization during an infectious outbreak but does not cover routine vaccination scenarios nor occupation-based compulsions observed internationally that balance public goals, labor laws and civil rights (Dionne, 2022). South Africa recently proposed specialized legislation introducing possible mandates for

identified high risk populations like healthcare workers if voluntary measures fail. Ghana must similarly re-examine crisis policy preparedness through societal lens. Politically too, leadership confidence in immunization systems aids uptake as evinced by Rwanda becoming globally one of fastest vaccinated nations led by vocal governmental advocacy and public-private partnerships that strengthened delivery, allowing emerging economy replication (Uwonda et al., 2021).

In summary, beyond proximate factors, macro forces shape attitudes. Protecting professional cohorts demands fixing fractured social compacts around immunization campaigns through transparency, equity, supportive legal regimes and consistent political buy-in against misinformation tailwinds.

Counter-analysis

While the socio-ecological framework provides a useful structure to analyze multi-level barriers and enablers for vaccine uptake, it has limitations. Critics argue that the approach is inherently descriptive rather than predictive, with causal mechanisms between layers poorly elucidated (Geoffrey, 2018). Simply characterizing attitudes and policies across strata does not automatically translate to tailored interventions. For example, Ghana has ample data now on health worker vaccination hesitancy drivers, yet turning such insights into impact remains challenging as most metrics remain stagnant despite awareness.

Secondly, literature suggests difficulty in neatly differentiating the contribution and interaction of specific ecological tiers. Survey data may ascribe resistance to individual beliefs when in reality community norms or workplace policies bear stronger blame or vice-versa. Quantitative attribution is often fuzzy (Kumar & Preetha, 2012). These risks misguided problem framing and solution targeting. Over-indexing on say, informational gaps without addressing socio-cultural blockers around vaccines will yield little.

Thirdly, the framework can overlook temporal effects and evolution. Vaccine sentiment is not static - what held true a year ago may no longer apply. As seen globally, initial high demand faded over time requiring recharged motivation. Adopting a longitudinal rather than cross-sectional analytical lens is thus vital (Fisher et al., 2020).

In conclusion, while no model is perfect, the socio-ecological approach still bears merit in structuring inquiry if applied judiciously by focusing on interlinkages, questioning causal ascriptions and updating for temporal shifts. Findings should feed iterative and adaptive intervention design rather than overly neat characterization alone. Triangulating data while contextualizing assumptions holds the key to meaningful impact especially for complex challenges like vaccine equity.

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