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Governing Microbial and Metabolic Life: The Biopolitical Plate—A Critical Sociological Review of Institutional Food Systems During Outbreaks

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Abstract

Background: Institutional food systems, particularly within hospitals and outbreak units, serve as critical nexuses of care and contagion during infectious disease outbreaks. Managed by multidisciplinary teams including Dietitians and Health Assistants, these systems balance nutritional healing with infection control, operating within a complex biopolitical framework.

Aim: This narrative review investigates the hospital food system as a sociomaterial vector for both infection and healing during outbreaks. It aims to synthesize evidence on pathogen surveillance, clinical roles in nutritional management, and the sociological governance of feeding protocols.

Methods: A comprehensive search of academic databases (PubMed, Scopus, Sociological Abstracts) was conducted for literature (2010-2024) on institutional foodservice, outbreaks, biopolitics, and clinical nutrition practices. Relevant studies were analyzed thematically.

Results: The review identifies persistent risks of foodborne and fomite transmission in outbreak settings, countered by evolving surveillance and protocolization. Nursing and dietetic practices are central to managing the tension between therapeutic diets and patient agency. Sociologically, outbreak responses manifest intensified biopolitical control, transforming feeding into a security practice that reconfigures space, ritual, and care.

Conclusion: The "biopolitical plate" encapsulates how institutional food becomes a site where biomedical power and microbial risk intersect. Future resilience requires integrating robust surveillance with ethically informed, patient-centered models that acknowledge food's social dimensions.

Keywords: Biopolitics, Hospital Foodservice, Infection Control, Outbreaks, Clinical Nutrition

Introduction

Infectious disease outbreaks, from the global crisis of COVID-19 to localized norovirus clusters, activate profound institutional reconfigurations aimed at securing life—a process central to Michel Foucault's concept of biopolitics, the governance of populations through the management of biological processes (Foucault, 2003). Within hospitals and designated outbreak units, the food system transforms from a background support service into a foregrounded apparatus of both care and control.

The "biopolitical plate" metaphor captures this duality: each meal tray represents a point where therapeutic intent intersects with infection risk, logistical challenge, and sovereign power over the body. Managed by a network of actors—Dietitians prescribing nutritional therapy, Health Assistants delivering and collecting trays, and Nurses assessing and advocating—institutional feeding becomes a critical vector in outbreak dynamics. This narrative review synthesizes a decade and a half of evidence (2010-2024) to examine how these systems function as sociomaterial vectors. It explores the laboratory surveillance of foodborne pathogens, the clinical management of patient nutrition amidst contagion, and the overarching sociological frameworks of biopolitics

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and risk that shape protocols governing isolation trays, communal dining, and the very logic of institutional feeding during crises.

Methodology

This narrative review employed a systematic search strategy to identify relevant English-language literature published between 2010 and 2024. Electronic databases including PubMed, Scopus, Web of Science, CINAHL, and Sociological Abstracts were queried using a combination of keywords and MeSH terms: ("hospital foodservice" OR "institutional food service" OR "clinical nutrition") AND ("outbreak" OR "pandemic" OR "COVID-19" OR "norovirus" OR "infection control") AND ("biopolitics" OR "risk society" OR "governance") AND ("dietitian" OR "nursing" OR "health assistant" OR "food safety"). Additional citations were identified through backward searching of reference lists. Inclusion criteria encompassed empirical studies (qualitative, quantitative, mixed-methods), review articles, and theoretical commentaries focused on food systems in hospitals, long-term care, or similar institutional settings during infectious disease events. Exclusion criteria included non-English publications and studies focused solely on community food security without institutional interface.

Food as a Vector

The hospital kitchen, typically a hub of mass production, becomes a laboratory-monitored biosecurity site during outbreaks (Table 1). Food and food contact surfaces are recognized reservoirs for pathogens like *Norovirus*, *Salmonella*, and *Clostridium difficile*, which can exacerbate outbreak morbidity in vulnerable populations (Carrasco et al., 2012; Belina et al., 2021). Surveillance studies consistently identify lapses in temperature control, cross-contamination between raw and ready-to-eat foods, and inadequate hand hygiene among food handlers as critical risk factors (Alves et al., 2021; Zagorski et al., 2021). The COVID-19 pandemic introduced heightened scrutiny, though evidence for food itself as a significant transmission route for SARS-CoV-2 remained limited; the primary risks shifted to fomite transmission via packaging, trays, and utensils, and aerosol transmission during unmasked eating (Gonçalves et al., 2021; Dietz et al., 2020).

This environmental risk necessitates rigorous microbiological monitoring. Regular swabbing of kitchen surfaces, equipment, and occasionally finished meals forms a cornerstone of Hazard Analysis Critical Control Point (HACCP) systems, a biopolitical technology that renders microbial life calculable and governable (Memon et al., 2021; McIntyre et al., 2013). During outbreaks, this surveillance intensifies, with sampling frequency increased and zones of scrutiny expanded to include tray assembly lines and dish return areas. The data produced informs what Parker (2020) terms "risk logics"—protocols that often manifest as enhanced personal protective equipment (PPE) for food service workers, the elimination of high-risk menu items (raw salads), and a shift to single-use, disposable packaging (Bui & Filimonau, 2021). These measures, while epidemiologically rational, also have unintended consequences, generating vast amounts of non-recyclable waste and symbolically framing the meal itself as a potential hazard (Reynier et al., 2021).

The role of food handlers, including Health Assistants responsible for tray delivery, is thus doubly constituted: they are essential workers maintaining nutritional supply chains, yet simultaneously positioned as potential vectors who must be disciplined into biosecure practice through training, surveillance, and sartorial markers like PPE (Gillespie, 2020). Their movements become choreographed by infection control policies, creating "clean" and "dirty" pathways that mirror the spatial segregation of patients. This transformation of the kitchen and its logistics into a monitored, regulated space epitomizes the biopolitical management of populations at the level of microbial circulation, where securing the food chain is tantamount to securing the biological life of the patient collective (Hinchliffe et al., 2016).

Table 1: Key Foodborne Pathogens and Control Measures in Institutional Outbreak Settings

Pathogen	Associated Foods/Surfaces	Documented Outbreak Risks in Institutions	Exemplary Control Measures During Outbreaks
Norovirus	Ready-to-eat foods, contaminated surfaces, and water.	Rapid person-to-person and environmental spread; major cause of closed-setting outbreaks (Lopman et al., 2016).	Enhanced environmental disinfection (viralcidal agents); strict exclusion of ill staff; possible suspension of fresh produce (Boxman et al., 2024).
***Salmonella* spp.**	Undercooked eggs, poultry, and raw produce.	Linked to central kitchen contamination affecting multiple wards (Schwensohn et al., 2022).	Rigorous temperature and time controls; separation of raw and RTE foods; supplier verification.
Clostridium difficile	Environmental surfaces, hand contact.	Spore transmission via fomites; links to antibiotic use (Furuya-Kanamori et al., 2015).	Contact precautions, dedicated disposable trayware, and meticulous hand hygiene with soap and water.

Listeria monocytogenes	Deli meats, soft cheeses, refrigerated ready-to-eat.	High mortality in immunocompromised patients (Buchanan et al., 2017).	Removal of high-risk items from patient menus; stringent fridge monitoring and cleaning.
SARS-CoV-2	Food packaging, trays, high-touch surfaces.	Primarily aerosol transmission during dining; fomite risk from trays/utensils (Dietz et al., 2020).	PPE for meal delivery staff; single-use disposables or high-temp dishwashing; isolation of patient meals.

Nutrition Care at the Bedside

At the patient's bedside, the institutional plate becomes an object of clinical negotiation, where biomedical authority meets individual agency. Dietitians, as experts in nutritional therapy, play a pivotal role in prescribing diets that support immune function, wound healing, and metabolic management during illness (Cederholm et al., 2017). During outbreaks, this role adapts to crisis conditions: nutritional assessments may be expedited or performed remotely, and diets may be standardized to streamline kitchen operations, sometimes at the expense of personalization (Bookari et al., 2023). The therapeutic diet itself is a biopolitical tool, an intervention designed to optimize the biological substrate of the body for the fight against infection (Lennon, 2021).

Nursing staff, however, occupy the crucial interface where these prescribed diets are accepted, refused, or partially consumed. Nutritional screening and monitoring, integral to nursing care, become even more vital when patients are isolated, and family members cannot assist with feeding (Chew et al., 2023). Nurses mediate between the institutional food system and patient subjectivity, confronting issues like loss of appetite due to illness, anosmia (as with COVID-19), or simply the monotony and poor palatability of repetitious isolation menus (Høier et al., 2021). Patient refusal of therapeutic diets is not mere non-compliance but a form of embodied resistance or an expression of distress, challenging the smooth operation of biopolitical nutrition (Hope et al., 2017).

Managing this refusal involves complex ethical and practical labor. Nurses and Dietitians must balance respect for patient autonomy with their professional duty to promote health, often engaging in persuasion, negotiation, or finding substitutes within the constrained menu (Weaver & Geppert, 2023). This interaction is further strained during outbreaks by infection control barriers: PPE impedes nonverbal communication, quick in-and-out room visits limit rapport building, and the fear of contagion can subtly alter the caring relationship (Liu et al., 2020). The meal tray delivered to an isolation room thus materializes a nexus of care and control; the act of feeding, a fundamental caring practice, is simultaneously a regulated, risk-managed procedure aimed at sustaining a life that is also a source of pathogen spread (Gordon et al., 2021).

Biopolitics, Risk, and Protocolized Feeding

The institutional response to outbreaks exemplifies what Ulrich Beck (2014) theorized as the "risk society," where modern systems generate and then seek to manage anthropogenic hazards (Table 2). The hospital food system is reconfigured through a lens of securitization, where every step—from procurement to waste disposal—is re-evaluated for pandemic risk. This governance operates through explicit protocols that are quintessentially biopolitical: they administer life by optimizing conditions for health while minimizing pathways for death (Foucault, 2003). The suspension of communal dining is a paradigmatic example. A social ritual promoting mobility and psychosocial well-being is recast as an unacceptable gathering risk, replaced by the solitude of the isolation tray (Stöhr et al., 2022). This spatial restructuring of eating governs bodies by containing them, reducing social interaction to halt microbial transmission (Pieroni et al., 2020).

The materiality of the meal undergoes a parallel transformation. The shift from reusable china to single-use disposable ware is a material enactment of risk logic, prioritizing barrier control over sustainability or sensory appeal (Reynier et al., 2021). Menu simplification—removing shared condiments, offering pre-plated choices only—streamlines operations for a depleted workforce and reduces touchpoints, but also diminishes patient choice and dignity (Elliott et al., 2023). These protocols create what sociologist Petrakaki (2017) calls "the quantified self in the risk society," where the patient's nutritional intake is closely monitored as a metric of both clinical progress and institutional safety performance.

Furthermore, these measures disproportionately impact vulnerable groups. Patients with dementia may find disposable utensils confusing, while those with swallowing difficulties (dysphagia) rely on texture-modified foods whose safety and presentation can be compromised by bulk production and delayed service in isolation (Wu et al., 2022). The biopolitical management of the population thus intersects with and can exacerbate existing health inequities, as standardized protocols fail to account for heterogeneous needs (Power et al., 2023). Ultimately, the governance of food during outbreaks reveals a tension between two forms of power: the disciplinary power that individualizes through clinical nutrition (the tailored diet) and the regulatory, biopolitical power that massifies through security protocols (the isolation tray). The outbreak tips the scale decisively

toward the latter, making the feeding of the collective a higher priority than the dining experience of the individual (Mansfield, 2012). Figure 1 presents the concept of the "biopolitical plate" as a central framework for understanding institutional food systems during infectious disease outbreaks.

Table 2: Sociological and Clinical Impacts of Outbreak-Driven Food System Changes

Aspect of Food System	Typical Pre-Outbreak Practice	Outbreak Protocol Modifications	Sociological & Clinical Implications
Dining Model	Communal dining rooms; social, ambulatory.	Universal room-service; isolated, sedentary eating.	Loss of psychosocial benefits, reduced mobility, increased patient loneliness (Stöhr et al., 2022).
Meal Service Materials	Reusable dishware, utensils, trays.	Widespread use of single-use disposable items.	Environmental waste burden; perceived reduction in meal quality/dignity (Reynier et al., 2021).
Menu & Choice	Selective menus, possibly cycle menus; condiment stations.	Simplified, pre-selected menus; pre-packaged condiments.	Reduced patient autonomy and satisfaction; potential nutritional inadequacy for specialized needs (Elliott et al., 2023).
Staff-Patient Interaction	Unimpeded communication during meal assistance.	Interaction mediated by PPE; reduced time in the room due to infection risk.	Impaired therapeutic relationship; difficulty assessing intake/needs; depersonalized care (Liu et al., 2020).
Nutrition Care Process	Standard clinical pathways with in-person assessment.	Remote or truncated assessments; prioritization of acute needs.	Fragmentation of care; risk of overlooking malnutrition in non-acute patients (Bookari et al., 2023).

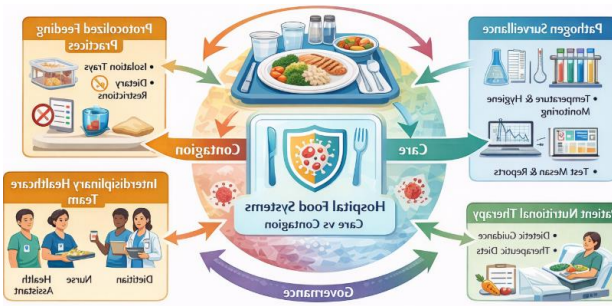

Figure 1: The Biopolitical Plate in Institutional Settings During Infectious Disease Outbreaks

Synthesis and Future Directions

This review elucidates the hospital food system as a critical, underexamined frontier in outbreak management—a sociomaterial assemblage where microbes, meals, policies, and people intersect. The "biopolitical plate" is a powerful heuristic for understanding this confluence. It captures how nutritional care, a fundamental therapeutic act, becomes inextricably bound with the logics of surveillance, security, and population-level risk management. Evidence confirms that while stringent food safety and infection control protocols are non-negotiable for preventing iatrogenic transmission, they generate significant collateral effects: environmental waste, nutritional compromise, and the erosion of social and dignifying aspects of eating (Bui & Filimonau, 2021; Reynier et al., 2021; Stöhr et al., 2022).

Moving forward, building resilient institutional food systems requires a dual approach. First, technological and procedural innovations must be embraced. This includes investment in touchless tray delivery systems, advanced dishwashing technologies that ensure safety without disposables, and digital platforms for remote nutritional screening and personalized menu ordering (Memon et al., 2021; Gordon et al., 2021). Enhanced, real-time environmental pathogen surveillance using molecular methods can provide more precise risk mapping (Boxman et al., 2024).

Second, and equally crucial, is the integration of an ethics-of-care perspective into outbreak planning. Protocols must be designed with greater flexibility to accommodate vulnerable populations, such as those with dementia or dysphagia (Wu et al., 2022). Training for all staff—from Dietitians and Nurses to Health Assistants—should emphasize communication skills through PPE and strategies for preserving patient dignity and choice within necessary constraints (Hope et al., 2017; Weaver & Geppert, 2023). Furthermore, the psychosocial dimension of eating must be formally recognized; when communal dining is suspended, alternative forms of social connection or sensory enrichment related to food should be explored.

Ultimately, the goal should be to evolve from a reactive biopolitics of containment—which rightly prioritizes security in crisis—toward a more holistic biopolitics of flourishing. This would seek to secure life not only from microbial threat but also from the dehumanizing and nutritionally detrimental side effects of the very systems deployed for protection. The plate delivered during an outbreak should remain a symbol of care, not merely a vector of control.

Conclusion

This narrative review has traversed the landscape of institutional food systems during outbreaks, from the microbiology of the kitchen to the sociology of the isolation room. It demonstrates that feeding patients in times of contagion is a profound exercise of biopower, involving the meticulous governance of spaces, materials, bodies, and biological processes. The interdisciplinary evidence synthesized reveals persistent tensions: between safety and sustainability, efficiency and personalization, clinical authority and patient agency. The COVID-19 pandemic has starkly illuminated these tensions, but they are inherent to the management of any infectious disease event in congregate settings. Recognizing the hospital food system as a "biopolitical plate" necessitates moving beyond a purely epidemiological or logistical framing. It calls for an integrated approach that values the meal as a complex event—at once a clinical intervention, a potential fomite, a cultural practice, and an expression of care. Future research and policy must therefore bridge the domains of infection control, clinical nutrition, environmental science, and medical sociology to design systems that are as adept at nurturing the human spirit as they are at neutralizing pathogenic threat.

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