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Food consumption pattern and socio-cultural beliefs among Paraja community of Koraput district, Odisha

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Abstract

This study examined food consumption patterns and socio-cultural dimensions of food practices among the Paraja community of Koraput district, Odisha. A descriptive cross-sectional design was conducted in 25 purposively selected villages, covering 400 households with at least one under-five child. Data was collected using 24-hour dietary recall, food frequency questionnaires, structured interviews, and focus group discussions. Quantitative data were analyzed using descriptive statistics, while qualitative information was thematically analyzed.

The findings revealed a predominantly cereal-based diet, with universal daily consumption of rice and millets, moderate weekly intake of animal-source foods, and limited consumption of fruits, green leafy vegetables, dairy products, nuts, and oilseeds. Pulses were consumed irregularly, indicating potential gaps in plant-based protein intake. Fish consumption was relatively higher than other animal foods, reflecting ecological accessibility and traditional livelihood practices. High reliance on tea and traditional alcoholic beverages was also observed.

Beyond nutrition, food practices were deeply embedded in spiritual life, ecological ethics, and social organization. Ritual offerings, harvest festivals, dietary taboos, and life-cycle food rituals functioned as indigenous mechanisms regulating food use and resource management. Overall, while the Paraja food system demonstrates cultural resilience and ecological adaptation, dietary diversity remains limited, highlighting the need for culturally sensitive, nutrition-focused interventions that strengthen indigenous food systems.

Keywords: Food consumption pattern, food taboos, food beliefs, rituals, festivals

1. Introduction

Food consumption patterns reflect the habitual ways in which individuals or groups choose, prepare, and consume food. These patterns are influenced by factors such as availability of resources, income, education, geography, and lifestyle, encompassing meal frequency, portion sizes, food types, and preparation methods. Over time, food habits may change due to urbanization, globalization, technological advances, and health awareness. Evidence from across India indicates that tribal populations generally consume cereal-based, carbohydrate-rich diets with limited inclusion of nutrient-dense foods, resulting in persistent nutritional vulnerability. While diets vary by region, tribal subgroup, livelihood system, and ecological context, studies in Gujarat and other western states report limited intake of fruits, milk, eggs, fish, and meat, whereas some Particularly Vulnerable Tribal Groups (PVTGs) in Andhra Pradesh maintain regular consumption of hunted or reared animal foods, though diets remain largely carbohydrate-dominated and seasonal variations affect food security (Sahu, 2018; Ghosh & Varerkar, 2019; Subramanyam & Rao, 2023) [18, 9, 21]. Indigenous and wild foods have been shown to contribute substantially to micronutrient intake among tribal populations in Jharkhand and central India, despite modest energy contribution (Ghosh *et al.*, 2020; Mishra *et al.*, 2021) [10, 13]. However, access to these foods is constrained by seasonality, cultural beliefs, and environmental factors. Socio-cultural beliefs play a crucial role in shaping dietary patterns. Traditions, rituals, taboos, and customs influence what is considered acceptable to eat, how food is prepared, and the social meaning attached to meals.

Food practices among tribal communities are deeply embedded in ritual life, belief systems, and ecological relationships, serving as markers of identity and social cohesion. Ceremonial foods and traditional alcoholic beverages are integral to festivals and life-cycle rituals, as observed among the Bonda of Odisha, Adi of Arunachal Pradesh, and Kharam of Manipur (Sahoo *et al.*, 2024) [17]. Nature-centered worship and ancestor veneration further influence food customs, such as among the Kora of West Bengal and the Savara of South Odisha (Chakraborty, 2018; Bhuyan, 2024) [6, 3].

Food taboos also affect dietary intake during critical life stages, including pregnancy, lactation, and childhood, with beliefs influencing the avoidance of certain plants and animal foods (Singh *et al.*, 2020, 2021; Rajitha *et al.*, 2021; Ade *et al.*, 2023; Devi, 2025) [19, 20, 15, 1, 8]. While some practices promote nutrient intake, others may restrict access to nutrient-dense foods.

Overall, tribal diets in India are largely cereal-based, often leading to nutritional inadequacy. Indigenous food systems and traditional practices hold significant nutritional potential while sustaining cultural identity, social cohesion, and ecological stewardship. However, dietary restrictions and seasonal limitations underscore the need for context-specific, culturally sensitive nutrition interventions. Notably, there is limited research on the Paraja tribal community of Koraput district, emphasizing the importance of documenting both their food consumption patterns and socio-cultural beliefs.

The present study has been conducted with the following objectives:

- To document the food consumption patterns of the Paraja community in Koraput district, Odisha.
- To record and describe the socio-cultural beliefs, taboos, and practices related to food among the Paraja community.

2. Materials and Methods

2.1 Study design and area

The present study employed a descriptive, cross-sectional research design. Villages with a high concentration of Paraja households were purposively selected to capture representative dietary and socio-cultural practices.

2.2 Study population and sampling

The study population included Paraja households, with emphasis on adults responsible for food preparation and child feeding. Within 25 selected villages, 400 households with at least one under-five child were randomly chosen for participation to ensure variability and representativeness.

2.3 Data Collection

2.3.1 Food consumption patterns

Data was collected using a 24-hour dietary recall and a food frequency questionnaire to document daily, weekly, and seasonal consumption of foods.

2.3.2 Socio-cultural beliefs

Structured interviews and focus group discussions were conducted to explore beliefs, taboos and rituals related to food.

2.4 Data analysis

- Quantitative data on food consumption were analyzed using descriptive statistics, including percentages, mean, and frequency distributions.
- Qualitative data on socio-cultural beliefs were thematically analyzed and presented with illustrative examples and verbatim quotes to capture the cultural context.

2.5 Ethical considerations

- Informed consent was obtained from all participants prior to data collection.
- Cultural sensitivities were respected, and confidentiality of participant information was maintained throughout the study.

3. Result and Discussion

3.1 Food consumption pattern

Food consumption patterns of Paraja households were assessed using the frequency of intake across major food groups (Fig. 1). The results indicate a diet strongly centered on staple foods, with limited diversification and pronounced seasonal influences on the availability of vegetables, fruits, and animal-source foods.

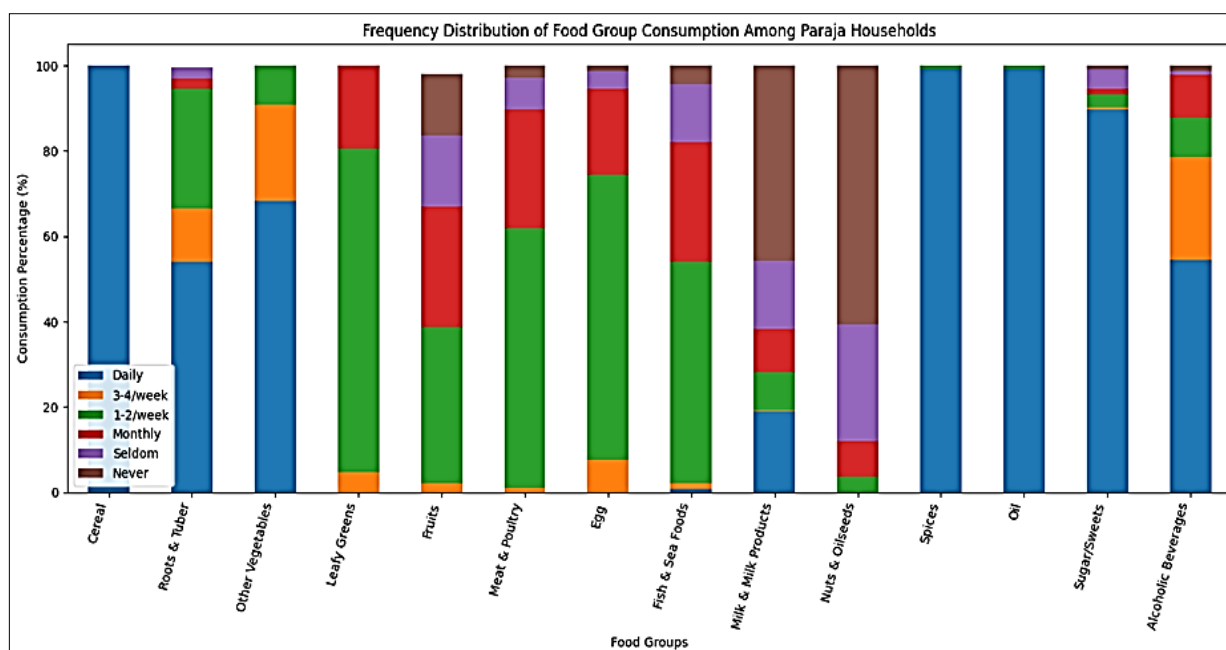


Fig 1: Frequency of consumption of food groups

Daily consumption of cereals was universal, confirming rice and millets as the dominant energy sources. Similar staple-heavy dietary patterns have been widely reported among tribal populations in Odisha, Jharkhand, and central India, where cereals contribute the largest share of daily energy intake (Sahu, 2018; Ghosh and Varerkar, 2019; Ghosh *et al.*, 2022) ^[18, 9, 11]. This dependence reflects both cultural food preferences and structural constraints in accessing diversified food groups. Intake of pulses and legumes remained largely irregular, with a majority of households consuming them on a weekly basis rather than daily. Comparable trends have been observed among tribal communities of Jharkhand and Kerala, where limited affordability and seasonal availability restrict regular pulse consumption. Since pulses are major plant-based protein sources in predominantly cereal-based diets, this pattern indicates potential protein inadequacy.

Vegetable consumption showed mixed trends. More than half of the households reported frequent consumption of roots, tubers, and other vegetables, likely due to their local availability and resilience to agro-climatic variability. Similar reliance on tuber crops and hardy vegetables has been reported among tribal populations of eastern India (Ghosh *et al.*, 2020; Surve *et al.*, 2022) ^[10, 22]. In contrast, a majority of households consumed green leafy vegetables on a weekly basis, reflecting underutilization despite their high micronutrient density. This pattern mirrors observations from tribal areas of Odisha and West Bengal, where seasonal dependence and limited preservation practices affect regular intake (Ghosh *et al.*, 2022; Pooja *et al.*, 2022) ^[10, 14]. Fruit consumption was generally low, with most households reporting infrequent intake. Comparable findings have been documented among tribal populations across central and eastern India, where market access, seasonal availability, and purchasing power constrain routine fruit consumption (Sahu, 2018; Pooja *et al.*, 2022) ^[18, 14]. Such low fruit intake contributes to inadequate vitamin and antioxidant intake.

Animal-source foods were consumed at moderate levels, mainly on a weekly basis. Fish intake was relatively more frequent than meat and poultry, reflecting ecological accessibility and traditional fishing practices, similar to patterns reported among tribal communities in northeastern and coastal regions (Atungbou, 2020; Subramanyam and Rao, 2023) ^[2, 21]. However, the overall frequency remained lower than that reported among some Particularly Vulnerable Tribal Groups (PVTGs), indicating livelihood and seasonal constraints influencing protein availability (Surve *et al.*, 2022) ^[22].

Milk and milk products were minimally consumed, with a substantial proportion of households reporting non-consumption. Low dairy intake has been consistently reported among tribal populations due to limited livestock ownership, storage constraints, and affordability barriers. This pattern suggests potential risks of calcium and high-quality protein inadequacy, particularly among women and children. Consumption of nuts and oilseeds was negligible, further reducing dietary fat quality and micronutrient density. In contrast, routine consumption of cooking oil and spices was widespread, reflecting habitual culinary practices rather than nutritionally balanced fat intake. Similar dietary fat patterns have been reported among tribal households in central India.

High reliance on sugar-sweetened beverages, particularly tea, was observed among most households. Previous studies among tribal communities have linked this pattern to affordability, cultural preference, and the absence of milk-based alternatives (Ghosh and Varerkar, 2019; Ghosh *et al.*, 2020) ^[9, 10]. Regular alcohol consumption was also common, consistent with reports from eastern tribal belts where traditional brews form an integral part of social and ritual life (Atungbou, 2020; Subramanyam and Rao, 2023) ^[2, 21]. However, this raises concerns regarding nutritional displacement and long-term health implications.

Overall, the dietary pattern depicted in Fig. 1 is characterized by heavy dependence on staple foods, moderate inclusion of animal-source foods, and limited consumption of fruits, dairy, nuts, and leafy vegetables. These trends closely align with dietary patterns reported across multiple tribal contexts in India (Sahu, 2018; Cordero-Ahiman *et al.*, 2017; Ghosh *et al.*, 2022) ^[18, 7, 10] and highlight the urgent need for nutrition-sensitive interventions that strengthen dietary diversity through improved access to indigenous foods, seasonal produce, pulses, and small-scale livestock within traditional food system frameworks.

3.2 Socio-cultural significance of food

Among the Paraja community of Koraput, food extends beyond nourishment, serving as a medium for expressing health, morality, spirituality, ecological awareness, and social identity. Dietary practices are governed by culturally embedded beliefs that link bodily well-being with environmental balance and ancestral approval. As one participant explained:

"We offer the first portion of our harvest to Hundi Devi and our ancestors; without this, we cannot eat even a grain. It keeps us healthy and the forest safe."

Dietary taboos, ritual foods, and festival cuisines form a moral and ecological framework that guides daily life, life-cycle transitions, and communal cohesion. These practices illustrate the Parajas' understanding of food as both a health and social instrument, consistent with studies on other tribal communities in India.

3.2.1 Nature and ancestor worship: Sacred groves and food ethics

Paraja cosmology is eco-centric, recognizing nature and ancestors as active custodians of health and agricultural prosperity. Elements such as land, forests, water bodies, hills, and celestial forces are considered sacred. Food practices are governed by moral obligations; the first portion of harvest is offered to deities and ancestors before human consumption, reflecting a strong ethic of restraint, reciprocity, and respect for nature. As one elder explained:

"If we eat without offering, the forest will punish us and crops will fail. Giving first keeps us healthy and protects nature."

Village sacred spaces, such as Nishani Munda, and deities like Hundi Debta, Jhankar Debta, Dongar Devta, and Duma Debta, guide agricultural and dietary practices. Such practices parallel observations among the Kumbia and Savara tribes, where sacred associations with food support ecological management (Gutierrez *et al.*, 2022; Bhuyan, 2024) ^[12].

3.2.2 Food taboos and dietary restrictions

The study findings reveal that food taboos among the Paraja community are structured around life stages, health conditions, and seasonal changes. Pregnancy-related dietary restrictions were widely reported by respondents. Women commonly avoided animal-source foods, certain fruits, pulses, and forest produce due to fears of miscarriage or adverse pregnancy outcomes. These findings align with studies from South and Eastern India (Subramanyam & Rao, 2023; Chakrabarti & Chakrabarti, 2019) ^[21, 51]. As a pregnant mother stated:

“If I eat jackfruit or goat meat now, the child may fall sick or become weak.”

At the same time, freshly prepared ragi gruel and simple rice preparations are preferred. These foods were perceived as light, strengthening, and safe for the developing fetus.

Postpartum and lactation diets focus on recovery and breast milk production. Women reported regular intake of ragi-

based gruel, rice water, boiled pulses, and herbal decoctions.

A lactating mother explained:

“After birth of the baby, we drink mandia pej every day because it helps in milk flow and gives strength.”

In contrast, several vegetables and animal-based foods were avoided during the early postpartum period due to concerns about infant digestive problems and illness. These restrictions were described as temporary and gradually relaxed as the child grew older. Similar observations were made by Singh *et al.*, 2021 ^[20] and Bista, 2020 ^[4].

Food is categorized as “hot” or “cold” to restore balance. Respondents reported consuming soft cereal-based foods during fever and diarrhea, while fruits and milk were encouraged during childhood infections such as measles. A caregiver noted:

“When the child has fever, we give rice water and ragi gruel because heavy food increases weakness.”

Table 1: Food beliefs during pregnancy and postpartum period

Sl. No.	Phases of life	Foods Avoided	Reasons	Foods Included	Reasons
01	Pregnancy	Leafy vegetables, pulses, jackfruit, ripe banana, eggs, fish, goat meat, fermented ragi preparations, mushrooms, field beans, coconut, and rice cakes	Harmful to the fetus and complicate childbirth	Fresh ragi gruel, rice, all other vegetables	Easily digested
2	Lactation	Leafy greens, brinjal, colocasia, jackfruit, dry fish, prawns, mushrooms, and fermented ragi	Harmful to the post-partum mother and child	Ragi gruel, water drained from boiled rice, boiled horse gram, papaya, garlic, lightly spiced vegetables, herbal decoctions	Regain post-partum health, Milk producing (Lactogenic)

Table 2: Food Beliefs and Dietary Practices during Illness

Illnesses	Foods Avoided	Reasons	Foods Included	Reasons
Fever	Curd, Banana, Landa, Cucumber, Ragi Pej	Considered as cold food	Rice, vegetables	Easily digested
Diarrhoea	Jau, non veg, tea	Difficult to digest and hot	Rice, brinjal	Good for stomach
Skin	Dry fish, brinjal	Irritating foods	-	-
Digestive issues	Jaggery, Egg, Tea	Considered as hot	Rice	Easily digested
Measles	Non veg	Ritual belief	ripe banana, rice and pej	Easily digested

Table 3: Seasonal and Ecological Food Taboos Among the Paraja Community

Season/Context	Foods Avoided	Perceived Reason	Ecological Significance
Rainy Season	Tubers, leafy greens, mushrooms, certain fish	Toxicity risk, spoilage	Protects against food poisoning
Breeding Season	Selected fish species	Cultural restriction	Supports fish conservation and biodiversity protection

3.2.3 Ritual foods in life-cycle ceremonies

Food occupies a central position in life-cycle rituals among the Paraja community, functioning as a symbolic medium that mediates social transitions, reinforces collective identity, and sustains spiritual continuity.

During childbirth, both the mother and the newborn observe a period of seclusion until the umbilical cord naturally falls off. The cord is ritually buried, followed by purification rites conducted by the *Disari* (traditional priest or healer). After reintegration into the household, communal meals are organized, symbolizing social acceptance and restoration of ritual purity. The name-giving and early feeding ceremony, usually conducted when the child is around seven to eight months old, marks the introduction of solid foods. The first cereal feeding typically involves *khichidi*, which is symbolically offered first to a cow before being fed to the child, reflecting beliefs related to purity, ancestral reverence, and nutritional well-being. As one participant stated:

“We never feed the child before the cow; it is the first gift to ancestors and ensures the child grows strong.”

Puberty rituals (*Dandi*) associated with menarche involve temporary seclusion of the adolescent girl and the consumption of light and easily digestible foods such as rice, puffed rice, banana, and jaggery. Following purification rites, a ceremonial feast is organized, marking the social recognition of womanhood. Marriage ceremonies are characterized by elaborate food preparations that include rice, millets, meat, and locally brewed liquor, symbolizing fertility, alliance formation, and continuity of kinship ties. In contrast, death rituals emphasize restraint and simplicity, with family members consuming plain gruels during the mourning period. Ritual offerings of rice, meat, and liquor are made to ancestors, reinforcing beliefs in spiritual continuity and the enduring relationship between the living and the departed.

Collectively, these food-centered practices highlight the integral role of traditional dietary customs in maintaining cultural identity and regulating social and spiritual life within the community.

3.3 Major festivals and food-related rituals

The ritual calendar of the Paraja community is closely synchronized with the agricultural cycle, reflecting an integrated relationship between food production, spirituality, and ecological stewardship. Consumption of newly harvested crops and forest produce is regulated through ceremonial observances, ensuring that no new food is consumed without ritual sanction. These practices reinforce gratitude toward nature and deities while functioning as culturally embedded mechanisms for sustainable resource management and food security.

Bihan Thapa (Seed Festival), celebrated in Baisak (April), marks the initiation of the agricultural season. Seeds collected from households are ritually purified and offered to village and domestic deities before redistribution for sowing. Symbolic offerings of flowers, rice, eggs, and incense in the fields emphasize the sacred status of seeds and promote community-based seed stewardship.

Uansh Parab (Crop Protection Ritual), observed in Gunicha (July), focuses on safeguarding transplanted paddy. Protective twigs (*Uansh munda*) from selected plant species are placed around fields to ward off pests and negative influences. The communal sharing of sweets and ritual care of cattle highlight collective responsibility during peak agricultural labor.

Nua Khia/Bandapana Parab (First Harvest Ritual), celebrated in August, marks the first consumption of new rice. Women identify healthy paddy plants and perform protective rituals, followed by the preparation of *charu* using new and stored grains. The subsequent Taku Parab permits seasonal consumption of forest foods such as mango kernel and bamboo shoots, reflecting regulated forest resource use and indigenous processing knowledge.

Dasara, celebrated in October, represents ritual renewal and inter-village solidarity. Community offerings, worship of sacred *Lathies*, and ritual performances such as Dhemsas dance and Desia Nata strengthen collective identity and social cohesion.

Dihadi Parab (November) honors cattle and celebrates harvest completion. Ritual bathing and decoration of cattle, followed by offering and communal sharing of khichidi, reflect the interdependence of livestock, agriculture, and food traditions.

Pus Parab (mid-December to mid-January) marks post-harvest prosperity. Ritual food sharing, preparation of millet-based cakes, communal roasting during Bhogi, and cultural performances reinforce kinship networks and social reciprocity.

Kandula Puja (Phagun, March) celebrates the first harvest of pigeon pea (*Cajanus cajan*), with ritual offerings preceding communal harvesting, emphasizing the nutritional and cultural significance of pulses.

Chait Parab (March-April), the concluding festival of the ritual calendar, integrates offerings, preparation of *charu*, communal hunting (*Benta Parab*), and collective celebrations. These activities strengthen intergenerational transmission of knowledge and reaffirm reciprocal relationships between the community and the natural environment. Overall, the Paraja ritual calendar mirrors indigenous seasonal festivals across eastern and north-eastern India (Chakraborty, 2018; Bhuyan, 2024; Atungbou, 2020) ^[6, 3, 2]. Regulation of first harvest consumption, communal feasting, and forest food access functions as a traditional governance system that promotes food sustainability, biodiversity conservation, and social cohesion (Singh *et al.*, 2020; Gutierrez *et al.*, 2022) ^[19, 12].

Table 4: Major festivals and food-related rituals of the Paraja community

Name of the Festival	Month of celebration (Paraja Calendar)	Key Food-Related and Agricultural Rituals
Bihan Thapa	April (Baisak)	Ritual purification and worship of seeds
Uansh Parab	July (Gunicha)	Crop protection and communal sharing of ritual sweets
Nua Khia/ Bandapana	August (Bandapana)	Ritual preparation and consumption of new rice harvest
Dasara	October (Dasara)	Community thanksgiving rituals
Dihadi Parab	November (Dihadi)	Cattle worship and new harvest celebration
Pus Parab	December-January (Pus)	Post-harvest prosperity rituals and communal feasting
Kandula Puja	March (Phagun)	Ritual offering and first consumption of pigeon pea (<i>Cajanus cajan</i>)
Chait Parab	March-April (Chait)	Seasonal offering of mango and charu; communal hunting and ritual feasting

4. Conclusion

The present study provides comprehensive insights into the dietary patterns and socio-cultural food practices of the Paraja community in Koraput district, Odisha. The findings indicate a strong dependence on staple cereals, moderate reliance on animal-source foods, and consistently low intake of fruits, dairy products, green leafy vegetables, and nuts. Such patterns mirror dietary trends reported among tribal populations across eastern and central India and reflect both structural constraints and culturally embedded food preferences. Limited dietary diversity may increase vulnerability to micronutrient deficiencies, particularly among women and young children.

At the same time, the study highlights the deep cultural significance of food within the Paraja community. Food-related rituals, taboos, life-cycle ceremonies, and seasonal festivals function not only as spiritual expressions but also as informal regulatory systems that promote seed

conservation, sustainable harvesting, forest stewardship, and communal sharing. These practices reinforce social cohesion and transmit ecological knowledge across generations, contributing to the long-term resilience of indigenous food systems.

The coexistence of nutritional vulnerability and cultural strength suggests the need for context-specific interventions. Nutrition programs targeting tribal populations should move beyond standardized dietary recommendations and instead incorporate indigenous foods, traditional processing methods, seasonal availability, and culturally acceptable behavior change strategies. Promotion of nutrient-dense local crops such as millets, pulses, leafy greens, and forest foods, along with small-scale livestock and fisheries, can enhance dietary diversity while preserving cultural integrity. In conclusion, strengthening the Paraja food system requires an integrated approach that combines nutritional improvement with the preservation of indigenous

knowledge and ecological sustainability. Recognizing and supporting traditional food practices can serve as a pathway toward achieving culturally appropriate food security, improved nutritional outcomes, and sustainable rural livelihoods.

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Competing interests

Authors have declared that no competing interests exist.

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