

# Indigenous pig farming in rural areas of Sierra Leone: Practices, constraints and impact on livelihood

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**ABSTRACT:** Poverty and inequality between urban and rural areas remained major social issues in Sierra Leone. These are drivers forcing rural people to engage in feasible livelihood options such as animal husbandry. The current study, that lasted for seven (7) months attempt to investigate pig farming in rural areas of Moyamba district, Sierra Leone. The overarching objectives were to assess the management practices, challenges, and livelihood impact of indigenous pig production. Two hundred and thirty (230) checklists were administered and interview sessions held for farmers from ten (10) randomly selected villages in Moyamba District, Sierra Leone. A total of 1123 pigs were recorded for which 66.5% were owned by women and 33.5% by men. It was observed that basic sanitary practices such as cleaning of the pen, provision of feeds and clean drinking water for pigs, castration and livestock disease management were lacking in the study area. This constitutes a great public health concern considering the link between animal and human diseases in contemporary history. Respondent noted income generation, food and cultural/religious benefits as pull factors for their engagement in the sector. Conversely, results indicates that the lack of credit facility (100%), high piglet mortality (92.2%), lack of or inadequate housing (86.5%), poor and inadequate feeding (86.1%), poor market facility (72.2%), animal cruelty (70.9%), persistence disease outbreaks (64.8%), intermittent theft (64.3%), poor or lack of treatment service (33.5%), lack of improved breeds (16.1%) and ineffective livestock extension services (4.3%) are the factors that undercut the productivity of pig farming in rural areas. The study has shown that there is need to scale up of livestock extension programs for rural areas through timely vaccination campaigns, sustained active case finding and capacity building of farmers to adopt good livestock management practice that will in turn sustain rural livelihood systems.

**Keywords:** Free range, management practices, rearing purposes, pigs, Sierra Leone.

## INTRODUCTION

Indigenous pig production (IPP) has a high prospect for growth and development, especially in resource-limited countries. It contributes immensely to the sustainability of livelihood among rural dwellers in many parts of Africa particularly Sierra Leone. Pigs are one of the most prolific domesticated animals with a high-efficiency rate in the conversion of kitchen wastes and other local feedstuffs (Danida, 2006). In Sierra Leone, the pig population (0.99%) is the least compared to chicken (65.2%), goat (12.3%), sheep (8.7%) and duck (6.0%), cattle (7.0%) (Population and Housing Census, 2015). They play multipurpose roles by providing affordable meat and

income which can be used for school fees, medication, clothing. Unlike the commercial pig sector which has different breeds (Duroc, large-white, and landrace), the West African dwarf pig is the only indigenous breed reared. They are usually short with thick skin, survive with little or no input, smaller in size compared to exotic pigs, attain an early age of sexual maturity due to continuous interaction with the boars, have a better adaptation and resistance to environmental conditions and some common diseases compared to the exotic breeds. They are completely managed at the free-range system. The system is preferred because the pigs have access to better nutrition

and freedom of movement which is in line with Ironkwe and Amefule (2008) report. Due to the free availability of local feedstuffs, pigs are allowed to scavenge during the day and return late in the evening where they are either confined or unconfined based on shelter availability and the attitude of their owners. Although, pigs in general are known to have high feed conversion ability, long hiking in scouting for feed may lead to greater loss of energy and possibly poor body conformation. With regards to their feeding nature, scavenging exposes them to diseases and parasitic infections which affects production. As a result of weak research, the high illiteracy rate among the indigenous pig farmers (IPF) and lack of public interest in native pigs, there is no detailed record or data on the constraints, opportunities and the current status of IPP in the country. Similar studies by Riedel et al. (2012), Chauhan et al. (2016), Haldar et al. (2017), Ouma et al. (2014), Hossain et al. (2011) and Emebet et al. (2017) have been conducted in Africa and beyond. On the contrary, there has not been any independent study in the district investigating IPP, management practices and significance to livelihood. This study will, therefore, present data on the current status of IPP, its practices and contributions in rural settings. It will also provide current information for public and private sectors to help structure programs that will support and improve the local pig sector in the country. Therefore, the main objectives of the study were to investigate 1. the management practices adopted by IPP farmers; 2. how indigenous pig rearing contributes to farmers' livelihood 3. document the prevailing challenges faced by pig farmers in the study areas.

## METHODOLOGY

### Description of study area

This piece of work was conducted in ten rural communities in Moyamba District located in the South-Western part of Sierra Leone. The district has an area of 6,902 square kilometers and it is the largest district in the southern province. In the West, it is bordered by the Atlantic Ocean, Bonthe District in the East and South, and in the North by the Tonkolili and Port Loko District. It has a total population of 318,588 (Statistics Sierra Leone, 2015) distributed in fourteen chiefdoms with its headquarter town, Moyamba. Like the rest of Sierra Leone, Moyamba District experiences two seasons i.e., the dry season which begins from November to April and the raining season from May to October. The mean annual rainfall varies from 125 mm to slightly above 250 mm, relative humidity of 72 to 80% in the raining and dry seasons respectively, with an average yearly temperature of 28°C (MDCDP 2013-2015).

### Description of the study sites

Ten villages known for IPP were included in the study, namely: Mokorewo, Lungi, Levuma, Mojaka, Mortemini,

Bambuibu, Bomotoke, Mopala, Kawela, Momenga. Each village is approximately twelve to fifteen kilometers (12 - 15km) apart from the other, with twenty to a hundred houses per village. The socio-economic characteristics of the study sites are almost same, with mix farming and crop production been the dominant livelihood activity. Furthermore, livestock rearing is also a common practice. Mining and fishing are practiced in some of the villages.

### Study design

The study was carried out within a period of seven months i.e., from November 2017 to June 2018. Villages were selected based on high pig density, rearing system, village access and willingness of pig owners to participate in the study. The Animal Science Department in Njala University, commercial motorbike riders and staffs of the District office of the Ministry of Agriculture and Food Security help to provided information on pig rearing sites. A confirmed visit was paid to each site and assesses the type of management system practiced. During the visit, meetings were held in all villages where the aim and objectives of the study were discussed and a date for assessment was agreed upon by each village. Two days for data collection were selected per village according to the pig farmers' schedule. A week to the proposed date, a reminder visit was paid to facilitate a maximum turn out.

### Data collection

Prior to the sampling event, enumerators were trained on the content of the questionnaire and the techniques for personal interviews. Fifteen questionnaires were administered to 15 IPP who were randomly selected in each village. Interview sessions were also held for respondents.

### Statistical analysis

Data generated were analyzed using the Statistical Package for Social Scientists (SPSS) version 23. Descriptive statistics (percentages, frequencies and averages) were used to present the findings through charts and tables. Data on personal interviews were transcribed into descriptive expressions to present clear and comprehensive information.

## RESULTS AND DISCUSSIONS

### Management practices

Gender, age, religion, marital status and education were investigated as personal characteristics of the respondents (Table 1). Result revealed that 61.3% of respondents are female and 38.7% are male. This is an indicator that IPP is a common practice among women as out of the 1,786 pigs recorded in this study, 66.5% were owned by women

and 33.5% by men. Majority of the respondents (31.7%) fall within the age range 40 to 49 followed by 30 to 39 (27.5%), 50 plus (23.9%) and 20 to 29 (18.7%). The result from this study revealed that, more than half of the IPF (55.7%) were without any formal education. However, few farmers had lower (38.7%) and tertiary (5.7%) education. As a Muslim dominated country, pig rearing was common among the non-Muslim farmers (90.1%) (Table 1). During the study, three types of management systems were identified which include: the free-range or intensive, semi-intensive and extensive systems. 70.9% of the pig farmers practice the free-range type due to lack adequate resources. The semi-intensive (20.0%) and intensive (9.1%) systems were practiced by farmers who were engaged in other economic activities (business) or those with former education/employment.

Farmers in general preferred rearing indigenous pigs because of their resistance against some diseases, adaptation to environmental conditions, prolificacy and their ability to survive under extreme conditions. Unlike crop production, pig farming was not the principal activity but a form of revenue generation in supplementing other agricultural activities. The day to day activities including feeding, cleaning, confining was mostly carried out by women and children (87.8%) compared to men (12.2%). A similar report was given by Niraula et al. (2015) where pig caring was mainly done by women. The main reasons for rearing indigenous pigs were for income generation (90.4%), food (6.5%) and cultural and religious ceremonies (3.0%) which are in line with Silva et al. (2016). Mbwambo (2015) reported income, food and employment as the main reasons why pig owners' rear pigs. Income generated from pig sales was used for school purposes (school fees and materials), medical bills, farming purposes, feeding and dressing which agrees with Mutua et al. (2011) and Mbwambo (2015) findings where pig farmers were able to afford the cost of education and healthcare services. It is important to note that the majority of the people in the study area had not gain formal education and thus are not formally employed. In view of the aforesaid, coupled with the obligation of providing basic necessity of life, pig rearing is the best livelihood option. It is generally perceived that it is meant for poor people. This was affirmed by this piece which recorded 95% of respondents that consider themselves poor which is comparable to a study conducted in the rural areas of Bangladesh by Hossain et al. (2011).

From Figure 1, respondents identified 11 constraints in the IPP. Among the constraints identified are lack of capital or credit facilities; high piglet mortality; housing and feeding were the most severe with a percentage above 80. Poor marketing; animal cruelty; diseases and theft were the second most important with a percentage of 60 to 70 while lack of treatment and improved breed, extension services were considered less severe. The major problem reported was lack of capital or credit facility for native pig rearers. Community banks and other financial institutions fail to give loans to pig farmers because they think farmers

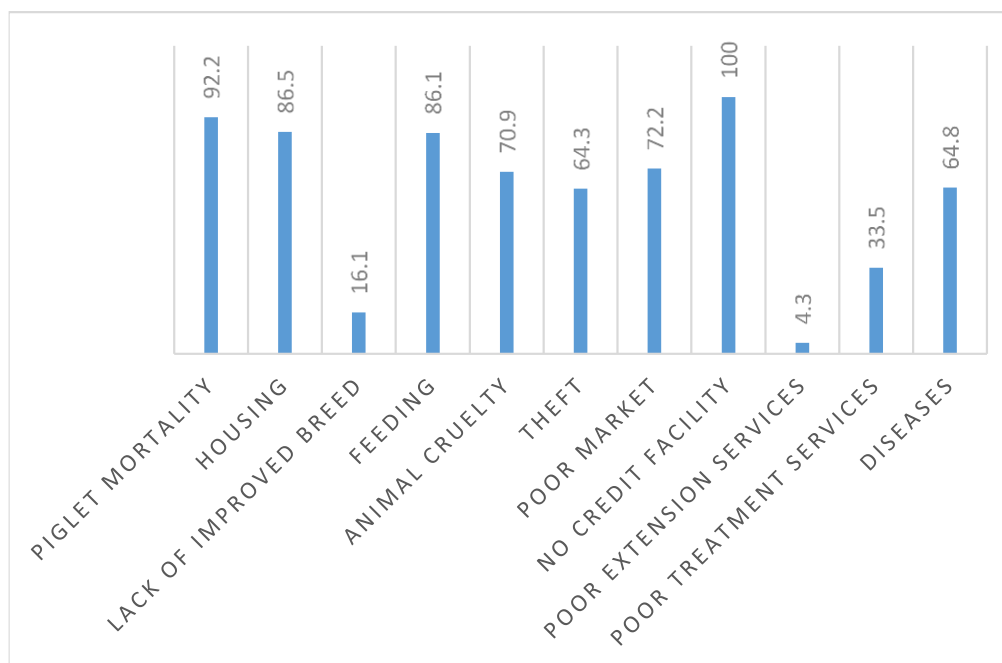
**Table 1.** Socio-economic features of IPF and the purpose of rearing pigs.

Parameters	Frequency	Percentage
Gender		
Male	89	38.7
Female	141	61.3
Religion		
Muslim	21	9.1
Christian	209	90.9
Cultural religious	7	3
Marital status		
Married	164	71.3
Single	33	14.3
Widow/divorce	33	14.3
Education		
Male	59	66.3
Female	43	30.5
Age		
20-29	43	18.5
30-39	59	25.7
40-49	73	31.7
50 +	55	23.9
Caretaker		
Women/children	202	87.8
Men	28	12.2
Purpose of pig rearing		
Food	15	6.5
Income	208	90.4

will not pay in return. The finding is in agreement with Suchiang et al. (2017). Weaning was another management problem which sometimes is caused by inadequate feeding. In all the study sites, piglets were not weaned. Natural weaning was the most effective and this normally happens when the sow is pregnant, severely sick, or is dead. Some pig owners consider weaning as a means of early starvation, reduce growth rate and maturity and cause weak immune status which results to sickness or death. There was no form of record keeping which may be due to lack of knowledge, awareness or neglect among the pig farmers.

### Housing challenge

From study, it is obvious that 77.83% have a pen, and 22.17% do not have any form of shelter which promotes free roaming (Table 2). These pens serve confinement purpose only during the night while they spend a greater



**Figure 1.** Constraints faced by pig farmers in percentage. Source: Author's research data, 2018.

**Table 2.** Pen and its management practices

Parameter	Frequency	Percentage
With Pen	202	87.7
Without a pen	28	12.2
Cleaning practices		
Daily	51	25.2
Twice/week	60	29.7
Weekly	81	40.1
No cleaning	10	5

Source: Author's research data, 2018.

part of the day scavenging.

Most of the pens were made of local materials like thatch, sticks, mud and bricks, rice bag, tapeline and zinc (Plates 1 and 2). Few pigs were confined in open fences without any roofing facility which may expose them to diseases and other environmental hazards (Plate 4). These pens differ in structure, orientation and sizes with no standard measurement due to farmers' status and knowledge. These pens are suitable for the dry season but worst in the raining due to running water which flows into these pens. Poor roofing conditions causing water to settle in pens which may harbor disease-causing agents that could be of threat to human health (Plate 3). Lack of money, the high cost of housing materials, poor awareness of the importance of housing and lack of labor were responsible for the lack of and the poor conditions of houses. Insufficient feeding, high incidence of stealing,

damage to pens and the lack of time to confine pigs also caused farmers to pay less attention in providing shelter.

Sanitary and hygiene condition of the pens was very poor. 25.2% practiced effective cleaning on a daily basis while 29.7%, 40.1% cleaned twice per week and weekly respectively with 5.0% who never cleaned their pens (Table 2). Most cleaning exercises were poor because of poor pen condition

#### Inadequate or lack of feed

In Africa and beyond, inadequate and lack of feed have been reported as a major constraint (Emebet et al., 2017; Ouma et al., 2014; Ajala et al., 2007; Chittavong, 2012, Pham et al., 2010) faced by IPF. 86.1% of the farmers fed their pigs while 13.9% did not feed.

Many farmers (65.78%) fed their pigs once per day while few farmers 13.1% and 21.2% fed twice or once per week respectively (Table 3). Variation in the feed pattern happened because of limited feed availability and pen location.

The major feeds fed were cassava, kitchen wastes (from neighbors and canteens), pawpaw, gari (processed form of cassava tuber) were frequently fed. Other feedstuffs like rice brown, potato vine, peels (plantain, banana, cassava), pumpkin and leftover were also fed but in smaller quantities. Similar finding has also been reported by Sangli et al. (2018). 60.1% of the respondents experience a shortage of feed throughout the year, 34.3% and 5.6% had feed shortage in the wet and dry seasons respectively.

All pigs were given the same type of feed eating together from the same feeding trough. Adequate feeding troughs



**Plate 1.** Pig shelter without a roof.  
Source: Author's research data, 2018.



**Plate 2.** Pigpen built with stick and tapeline.  
Source: Author's research data, 2018.

were lacking, hence pigs were fed in metal plates, rubber and wooden containers (57.1%) (plate 5). Bared floor (16.2%) and cement/concrete (26.7%) floors also served as feeding troughs (Table 3). The method of feeding was poor which could possibly result in infection and feed wastage.

The provision of adequate and good drinking water was lacking in many pig rearing sites. 56.5% farmers supplied drinking water only twice a week while 43.5% supplied water when feeding in the morning. The major sources of water were well water, swamp, pump, rain and river water.

Water containers were not regularly cleaned and sometimes it is cleaned when the water has finished.

#### **Disease problem**

The result from the study shown that mange (100.0%), respiratory infection (89.1%), genital infection (15.7%), foot rot (44.3%) and swine diarrhea (65.7%) which was common among the piglets were the main disease problems. Tick (100%), worm (18.3%), lice (66.5%) were



**Plate 3.** Pig shelter with a muddy floor.



**Plate 4.** An open fence serving as a shelter.

reported as the most common parasites throughout the year (Figure 2). Many reports have shown pig diseases are a concern to public health (Mahanty et al., 2010) and affect pig performance (Carter et al. 2013). Most farmers observed that in the dry season, some pigs developed wounds on the skin due to continuous itching on the wall and other sharp objects. A similar observation was reported by Ironkwe et al. (2008). 80.8% of the farmers lack access to treatment services due to insufficient trained and experienced veterinarians and Animal Health workers. Because of this, farmers respond differently to the disease outbreak. 79.1% of the respondents reported to have been slaughtering sick animals to either eat or sell, 76.5% traditionally treat sick pigs, 19.1% report to veterinarians or community animal health workers while

15.2% apply no treatment or control measures. This result is similar to Patr et al. (2014) finding where pig farmers admitted of slaughtering sick animals to eat at home or sell. High mortality rate (40.0%) among young piglets within the ages of one to two months was reported as a major constraint by the farmers. Diseases and parasitic infestation (tick, worm, mange), lack of adequate diet, crushing, cool weather during the rains or winter and poor management practices were highlighted as the main causes. Similar reports have been given by Ocampo et al. (2005) and Agyemang (2017) who documented a mortality rate of 17% due to crushing and health problems and shortage of feed within the first day of farrowing.

The weak veterinary services coupled with limited veterinary workers or community animal health workers

**Table 3.** Feeding and its practices.

Parameter	Frequency	Percentage
Feeding	198	86.1
No feeding	32	13.9
Once a day	130	65.7
Twice a day	26	13.1
Weekly	42	21.2
Feed shortage		
Yearly	119	60.1
Wet season	11	34.3
Dry season	68	5.6
Feeding/water container		
Cement floor	53	26.7
Bared floor	32	16.2
Other containers	113	57.1

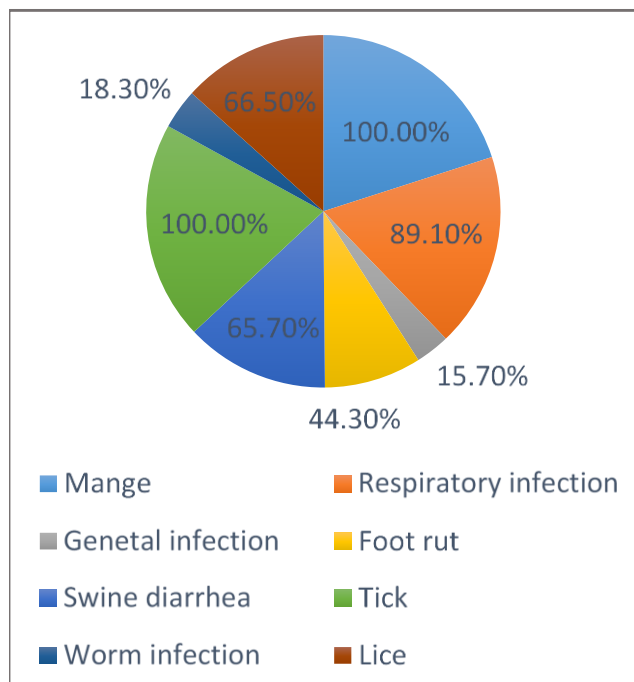
Author's research data, 2018.

**Plate 5.** Feeding containers with poor cleaning practices.

Source: Author's research data, 2018.

were identified as a contributing factor for the rapid and continuous spread of many preventable diseases. Pig farmers in remote areas did not have access to any healthcare providers causing the death of large number of pigs in many villages. To minimize the infection and mortality rate as well as the economic loss, different control

methods such as traditional and modern medicines should be adopted. Human medicines were reportedly used for the treatment of diarrhea; herbs (pawpaw fruit) were used as control measures for internal parasites (worm). Engine oil, lime water and ash-salt solution were reportedly used in the control of mange and other external parasites (tick)



**Figure 2.** Diseases and parasites identified by pig farmers in percentage. Source: Author's research data, 2018.

which is in line with Wabacha et al. (2004) study who reported engine oil as a common treatment against mange. In areas with tick infestation and closed to a district livestock center, farmers sometimes use commercial drug like ivermectin or use sharp instruments to cut off large ticks from the body of the animals. The domestic and wild animal interactions were considered as the disease epidemiology due to the close connection between sick and healthy animals in villages. Pig owners reported that worms, ticks, mange and other diseases were difficult to control due to free-range system. Farmers' knowledge on disease management was low. Some pig owners thought there is no treatment for pigs if they get sick and therefore did not treat their sick animals. Healthy pigs were not separated from unhealthy ones which was a major cause to disease transmission within the herd. In addition, pigs (sick or healthy) were fed and watered together and as well shared the same pen. Further enquiries also confirmed that, a large number of pig rearers were not familiar with practices like vaccination, deworming, dipping and castration.

### Market facility

Table 4 shows that, 91.3% of the farmers lack market facility in their surrounding which caused them to travel with their animals for sales. This is in collaboration with Emebet et al. (2017) report where 100% of the respondents lack market opportunities. Majority (84.78%) of the respondents accept this situation by selling within

**Table 4.** Market characteristics in rural settings.

Parameter	Frequency	Percentage
<b>Market customers</b>		
Middlemen	93	40.4
Community members	35	15.2
R.S.C groups	52	22.6
Restaurant keepers	9	3.9
Meat sellers	19	8.3
Breeders	16	7
Traders	6	2.6
<b>Period of sales</b>		
Beginning of school year	19	8.3
Beginning of planting season	24	10.3
During disease outbreaks	30	13
Festival seasons	10	4.3
During feed shortage	44	19.1
In need of instant cash	103	44.8
No community market	210	91.3
Sell within community	121	52.5
Search for a market facility	109	47.4
Sell live animals	171	74.3
Slaughter and sell	59	25.7
<b>Market challenges</b>		
Variation in price	88	38.3
Lack of market information	50	21.7
Long distance to market center	40	17.4
No storage facility	17	7.4
Poor processing and handling of meat	35	15.2
<b>Number of pigs sold per year</b>		
3-Jan	139	60.4
6-Apr	66	28.6
9-Jul	14	6.1
10 and above	11	4.9

Source: Author's research data, 2018.

their communities at a very low cost. 74.3% of the farmers sell live animals while 25.7% slaughter and sell. The number of animals sold ranged from one to ten per year as shown in Table 4. Although there were many customers identified along the market chain (community members, social or religious group, restaurant keepers, local breeders and traders), middlemen (40.2%) were the largest customers. These customers move from village to village to buy pig at lesser price especially in the raining season when the farmer is in dial need of money to provide food at home. Muhanguzi et al. (2012) in Uganda also attest that, pig market to be characterized by middlemen who purchased farmers' pigs at low prices and sell to make



**Plate 6.** Plate pigs on their way to market on a motorbike. Source: Author's research.

more profit.

At the beginning of the school year (8.3%), cropping season (10.3%), during disease outbreak (13.0%), festivals (4.3%), feed shortage (12.2%) and when in need of instant cash (44.8%), farmers prefer to sell most. Motorbike, vehicle and manual carrying were the means of transportation (Plate 6). Poor road network and long distances, lack of market information, price fluctuation, no storage facility of processed meat and the lack of modern technology in handling and processing of meat were some of the challenges highlighted by the respondents. The finding in this report is similar to that of Kagira et al. (2010) but contrary to Niraula et al. (2015) where market information was accessible to pig farmers.

## Conclusion

Indigenous pig production performs important functions in the livelihoods of many rural dwellers by fulfilling unique socio-cultural demands. The IPP which is mainly owned and managed by women is still at the subsistence level and managed under the free-range system. However, IPP is suffering from lack of credit facility, high mortality rate, inadequate housing, feed shortage, poor market structure and animal cruelty. There is need for government and private organizations to provide loan to people that are engaged in pig rearing. The problem with high mortality rate and cruelty to animal require proper management practices such as the provision of adequate housing and proper disease management control. Therefore, extension services and animal health husbandry practices must be strengthened to increase the farmers' awareness on proper management practices in diseases control and

prevention; correct feeding practices as well as accepting new technological innovation to ensure sustainable production. Provision of services like deworming, castration, filling and vaccination to pig rears are recommended. In order to reduce marketing challenges faced by pig farmers and increase their income level, government should create a well-structured market facility which can be easily access by farmers. Further research is required on: pig major diseases, the role of women in local pig production and the impact of IPP on employment, income generation and poverty alleviation in rural settings of Sierra Leone.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

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