

Research article

An assessment of awareness and practicing status regarding personal and animal hygiene among livestock farmers in semi-urban areas of Barisal district, Bangladesh

Abu Sayed¹, Ishrat Jahan Shathi², and Md. Mostafijur Rahman^{2}*

¹Faculty of Animal Science and Veterinary Medicine, Patuakhali Science and Technology University, Barishal, Bangladesh.

²Department of Pathology and Parasitology, Faculty of Animal Science and Veterinary Medicine, Patuakhali Science and Technology University, Barishal, Bangladesh.

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**Corresponding author:*

Cell: +88-01717694326

E-mail: mrrana@pstu.ac.bd

The knowledge gap of livestock farmers on proper farm hygiene practices is one of the major concerns in Bangladesh. Therefore, the study was performed to assess the awareness and practicing status regarding personal and animal hygiene among livestock farmers in selected semi-urban areas of Barisal district, Bangladesh. A total of 202 farmers were interviewed to collect data randomly from four distinct suburban villages of Barishal district. SPSS software (version 25) was used to code and analyze the raw data. The research revealed that 68.3% of the farmers used tube well for supplying water to the animals. On the other hand, all the farmers were found to use tube-well for family use. 58.4% of farmers never used disinfectants regularly on their farms. Additionally, 40.1% of participants never practiced a routine deworming schedule. Attending seminars was found to have effects on washing and feeding troughs ($p < 0.05$) and the application of disinfectants on a regular basis ($p < 0.01$). Since a large percentage of livestock keepers are not still aware of animal and personal hygiene, the government and other non-government organizations should adopt necessary steps to disseminate knowledge among livestock owners for their animal and personal hygiene in order to prevent various zoonotic and anthroponotic diseases.

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1. INTRODUCTION

Zoonotic diseases are categorized as contagious that can be transferred between humans and wild or domestic animals naturally (Slingenbergh et al., 2004). The majority of the newly emerging infectious diseases in the present world are zoonotic that include approximately 60% of human diseases (Jones et al., 2008; Karesh et al., 2012; Seven, 2016; Wang and Cramer, 2014; Wolfe et al.,

2007). Approximately 2.7 million people are dying every year due to outbreaks of these infections (Gebreyes et al., 2014). Both public and animal health is at risk in today's world due to this alarming problem. Besides this, it is significantly responsible for the economic destruction of a country (Dahourou et al., 2019). In fact, some zoonotic diseases such as brucellosis, avian influenza, anthrax, rabies, and others are becoming serious concerns for both

animals and human health in Bangladesh (Hossain et al., 2012; Kendall et al., 2010; Rahman et al., 2011; Samad, 2013; Sultana et al., 2012). Most of the infectious diseases can be prevented by practicing proper animal and personal hygiene (Saloniemi, 2003).

In today's world, one of the most precious resources for developing countries is the livestock sector. This is a valuable impetus in the field of economics and food consumption (Herrero et al., 2013). Approximately 1.3 billion people live in developing countries that depend explicitly or implicitly on livestock for their subsistence (Khan et al., 2018). Apart from livelihoods, most people rear livestock for the consumption of food as it is an excellent source of nourishment (Bundala et al., 2020). Since a significant proportion of the total population depends on livestock rearing either for subsistence or food consumption, it is quite crucial to practice healthy farming. Several studies have identified unhygienic farming as the underlying cause of different animal, anthroponotic and zoonotic diseases (Heuvelink et al., 2007; Jacob et al., 2020; Khan et al., 2020; Nga et al., 2019; Nyokabi et al., 2018; Seimenis and Battelli, 2018). As a result, multiple studies already emphasized the maintenance of proper hygiene to attain optimum production of animal and animal products (Bhakat, 2017; Fawi, 2019; Kwaghe et al., 2016; Pham-duc et al., 2019; Sadharakiya et al., 2019; Sasakova et al., 2016; Sorge et al., 2019). Therefore, the study aimed to comprehend the awareness and practicing status of livestock keepers regarding animal and personal hygiene in selected peri-urban areas of Barishal district.

2. MATERIALS AND METHODS

Study area

The survey was performed through a random selection of four different villages (Guthia, Rahamatpur, Babuganj, and Karapur) in Barishal district.

Study period

The study was conducted from 8 September 2021 to 24 February 2022 for about 6 months.

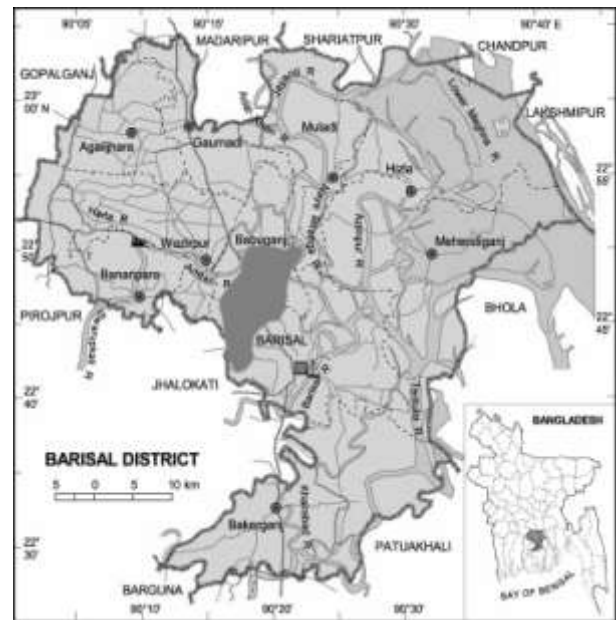


Figure 1. The study area (dark colored)

Sample size and data collection

All the farmers were the target population and 202 farmers who consented to participate in this study were the study population. All the farmers were interviewed using a pre-tested questionnaire. After defining and interpreting all the variables in mother tongue, all of the questions were provided to the respondents. All of the participants gave spontaneous answers to all the questions.

Data input and analysis

The data was tabulated, processed, and finalized in Microsoft Excel (2010). The final data was then analyzed using SPSS (Statistical Package for Social Sciences) software (V25). The frequencies were expressed in percent (%) and the statistical relationships were observed using correlation analysis.

3. RESULTS AND DISCUSSION

The total number of respondents in this study was 202 (Table 1). The ages of all the farmers ranged from 20 to 86 years. The majority of the participants had completed secondary (45.5%) level followed by primary (29.2%), higher secondary (8.4%), graduation, and post-graduation (1.5%). It was quite satisfying that the illiteracy rate was only about 14%. These

findings indicate that a good number of respondents connected with livestock farming were educated. In terms of primary occupation, a large number of farmers (33.2%) were involved in the business.

The data presented in Table 2 shows the farmers' farm hygiene practices and management strategies. None of the farmers used pond water for household use (Table 2). On the contrary, nearly 28% of them used pond water for their animals which was not a good hygienic farm practice. The animals supplied by pond water are more prone to have different water-borne parasitic and bacterial diseases including amoebiasis, schistosomiasis, fascioliasis, botulism, campylobacteriosis, cholera, colibacillosis and so on (Pal et al., 2018).

We found that 47.5% of the farmers used the wood floor for the farmhouse, followed by earth 24.3%, brick 14.9%, and concrete 13.4% respectively. A study conducted by (Nilsson, 2005) highlighted the importance of considering several factors during the floor construction of a farmhouse. Animals living on muddy (earth) floors are more exposed to various soil-borne infections such as anthrax and blackleg, ascariasis, and so forth (Dessie and Menziri, 2017; Velasquez-Manoff, 2012).

We found 96.5% of farm-house were constructed in high areas while 3.5% were in a water-logged position. Water-logged areas assist in the propagation of several external parasites that can transmit several vector-borne diseases to farm animals. About 64.4% of the farmers asserted cleaning their farmhouses routinely. On the other hand, 35.6% of farmers replied negatively. In addition, almost three-fifths of the farmers replied that they washed feed and water troughs regularly. (Knight et al., 2009) reported that providing good care to animals including good management, housing, and feeding is a vital concern that influences both animal and human welfare and productivity. An unhygienic farm always promotes the growth of different microorganisms like fungi, food-borne bacteria, etc. that may infect the farm animals (Delahoy et al., 2018; Dhama et al., 2015).

In our study, we found that only about 42% of the farmers used to apply disinfectants and follow pest control strategies in their farms regularly. According to (Smith et al., 2022), pests cause several adverse consequences on livestock farming, including 1. lowering animal production; 2. declining quality of animal products; 3. adding expenses needed to restore the optimum amount of animal production; 4. causing high expenditures on human health related to zoonosis and disease control; 5. affecting animal welfare, and 6. limiting the domestic and international markets of animals or animal by-products. In terms of practicing personal hygiene, 96% of the farmers used to wash their hands before and after contacting the animals which was quite interesting and satisfactory for preventing several zoonotic infections.

Data in Table 3 represents the farmers' knowledge regarding hygiene practices and the propagation of diseases. The study showed that 73.3% of respondents did not know about disinfection and disinfectants. An almost similar outcome was observed among dairy farmers in a study conducted by (Jadav and Raval, 2019).

In this survey, surprisingly more than 90% of respondents lacked knowledge of zoonotic and anthroponotic diseases. Additionally, when the farmers were asked about the mode of transmission and prevention of the diseases, 95% assured their ignorance. Several studies have already been reported and shown the knowledge gap on zoonotic infections and their transmissions (Afrin Chowdhury et al., 2018; Islam and Ahmed, 2019; Jadav and Raval, 2019; Kelly et al., 2018).

Attending seminars has been found to significantly affect the frequent use of disinfectants ($p < 0.01$) and washing of feeding troughs ($p < 0.05$), both of which are desirable strategies for preventing diseases (Table 4). However, the majority of farmers were out of awareness programs and seminars regarding the consequence of unhygienic farming (Figure 2) that affects both animal and public health constantly.

Table 1. Demographic profile of the respondents

Total number of respondents		202	
Range of age (years)		20-86	
Variables	Value (ranges)		
	Category	Frequency(n)	Percent %
Year of schooling	Illiterate	28	13.9
	Primary	59	29.2
	Secondary	92	45.5
	Higher secondary	17	8.4
	Graduation	3	1.5
	Post-graduation	3	1.5
Primary occupation	Business	67	33.2
	Service holder	38	18.8
	Laborer	24	11.9
	Agriculture	33	16.3
	Unemployed	1	.5
	Driver	19	9.4
	Retired service holder	15	7.4
	Expatriate	5	2.5

Table 2. Farmers' status of farm hygiene practices and management strategies

Variables	Value (ranges)		
	Category	Frequency(n)	Percent%
The main source of drinking water for family use	Tube-well	202	100.0
	Pond	0	0
	Well	0	0
	River	0	0
	Canal/Lake	0	0
Floor of the farmhouse	Concrete	27	13.4
	Brick	30	14.9
	Earth	49	24.3
	Wood	96	47.5
The main source of water for farm animals	Tube Well	138	68.3
	Pond	56	27.7
Farm-house condition	Elevated	195	96.5
	Waterlogged	7	3.5
Routine farmhouse cleaning	Yes	130	64.4
	No	72	35.6
Washing of feeding and water trough regularly	Yes	120	59.4
	No	82	40.6
Using disinfectants routinely	Yes	84	41.6
	No	118	58.4
Measures were taken for pest management on the farm	Yes	84	41.6
	No	118	58.4
Hand washing before and after contacting animals	Yes	194	96.0
	No	8	4.0

Table 3. Farmers' awareness regarding hygiene practices and propagation of diseases

Variables	Value (ranges)		
	Category	Frequency(n)	Percent %
Do you know about disinfection and disinfectants?	Yes	18	8.9
	No	148	73.3
	May be	36	17.8
Are you aware of zoonotic and anthroponotic diseases	Yes	16	7.9
	No	186	92.1
Do you have any knowledge about the transmission of zoonotic and anthroponotic diseases?	Yes	10	5.0
	No	192	95.0
Do you know zoonotic and anthroponotic diseases can be prevented by proper hygiene maintenance?	Yes	26	12.9
	No	176	87.1

Table 4. Effects of attending seminars on better farm hygiene practices and management strategies

Variables	Pearson correlation (R and P)	
	Seminar attending status of the farmers	
The floor of the farmhouse	R	0.062
	p	0.378
The main source of water for farm	R	0.1500
	p	0.033
Farm House condition	R	-0.085
	p	0.231
Routine farmhouse cleaning	R	-0.072
	p	0.307
Regular dung cleaning	R	-0.012
	p	0.862
Washing of feeding and water trough regularly	R	0.147*
	p	0.037
Using disinfectants regularly	R	0.200**
	p	0.004
Measures were taken for pest management on the farm	R	0.170
	p	0.015
Hand washing before and after contacting animals	R	-0.069
	p	0.326

*Correlation is significant at 0.05 level; ** Correlation is significant at 0.01 level

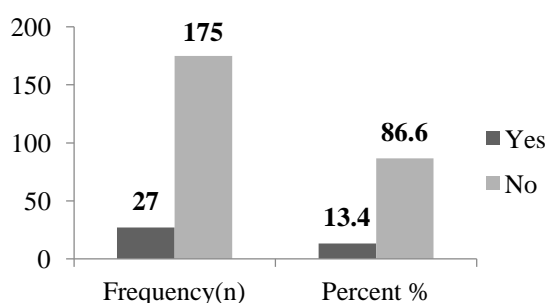


Figure 2. Seminar attending status of the farmers on livestock rearing and hygiene practices

4. CONCLUSION

A large proportion of educated livestock keepers are still unaware of and unconcerned about hygienic farm practices and management. Providing sufficient training opportunities and organizing more seminars, and awareness programs by government and non-government organizations might help to secure both animal and human health.

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REFERENCES

- Chowdhury, A. T., Shanzana, P. and Nusrat Zahan, F. 2018. Knowledge, Awareness and Risks of Zoonotic Diseases Among the Smallholder Livestock Farmers in Suburban Areas of Sylhet, Bangladesh. *Advances in Biology & Earth Sciences*, 3(1): 69–84.
- Bhakat, C. 2017. Factors Affecting Hygienic Milk Production for Farmers of Nadia Dist. *Journal of Agricultural Engineering and Food Technology*, 4(1): 13–16.
- Bundala, N., Kinabo, J., Jumbe, T., Rybak, C. and Sieber, S. 2020. Does homestead livestock production and ownership contribute to consumption of animal source foods? A pre-intervention assessment of rural farming communities in Tanzania. *Scientific African*, 7, e00252.
- Dahourou, L. D., Ndayikeza, C., Savadogo, M. and Gbati, O. B. 2019. Prevalence and economic losses resulting from parasitic zoonosis on swine and ruminants in Ouagadougou abattoir (Burkina Faso). *International Journal of Biological and Chemical Sciences*, 12(5): 2226.
- Delahoy, M. J., Wodnik, B., McAliley, L., Penakalapati, G., Swarthout, J., Freeman, M. C. and Levy, K. 2018. Pathogens transmitted in animal feces in low- and middle-income countries. *International Journal of Hygiene and Environmental Health*, 221(4): 661–676.
- Dessie, D. and Menzir, A. 2017. Temporal And Spatial Distribution Of Common Bacterial Livestock Disease Outbreaks In North Gondar, Ethiopia. *International Journal of Advanced Research and Publications*, 1(3): 57–61.
- Dhama, K., Karthik, K., Tiwari, R., Shabbir, M. Z., Barbuddhe, S., Malik, S. V. S. and Singh, R. K. 2015. Listeriosis in animals, its public health significance (food-borne zoonosis) and advances in diagnosis and control: a comprehensive review. *Veterinary Quarterly*, 35(4): 211–235.
- Fawi, N. M. T. 2019. Effect of Manure Management Strategies Implemented in Dairy Farms on Animal Health and Milk Hygiene in Khartoum , Sudan. *October*. https://www.researchgate.net/profile/Nahid_Fawi3/publication/336440968_effect_of_manure_management_strategies_implemented_in_dairy_farms_on_animal_health_and_milk_hygiene_in_khartoum_sudan/links/5da08988299bf116fe9eb102/effect-of-manure-management-strateg
- Gebreyes, W. A., Dupouy-Camet, J., Newport, M. J., Oliveira, C. J. B., Schlesinger, L. S., Saif, Y. M., Kariuki, S., Saif, L. J., Saville, W., Wittum, T., Hoet, A., Quessy, S., Kazwala, R., Tekola, B., Shryock, T., Bisesi, M., Patchanee, P., Boonmar, S. and King, L. J. 2014. The Global One Health Paradigm: Challenges and Opportunities for Tackling Infectious Diseases at the Human, Animal, and Environment Interface in Low-Resource Settings. *PLoS Neglected Tropical Diseases*, 8(11): e3257
- Herrero, M., Grace, D., Njuki, J., Johnson, N., Enahoro, D., Silvestri, S. and Rufino, M. C. 2013. The roles of livestock in developing countries. *Animal*, 7(SUPPL.1), 3–18.
- Heuvelink, A. E., Valkenburgh, S. M., Tilburg, J. J. H. C., Van Heerwaarden, C., Zwartkruis-Nahuis, J. T. M. and De Boer, E. (2007). Public farms: hygiene and zoonotic agents. *Epidemiology and Infection*, 135(7): 1174–1183.
- Hossain, M., Ahmed, K., Bulbul, T., Hossain, S., Rahman, A., Biswas, M. N. U. and Nishizono, A. 2012. Human rabies in rural Bangladesh. *Epidemiology and Infection*, 140(11): 1964–1971.
- Islam, S. and Ahmed, M. S. 2019. Knowledge, attitude, and practice toward zoonotic diseases among different professionals at selected coastal areas in Barguna district, Bangladesh. *Journal of Advanced Veterinary and Animal Research*, 6(3): 284–289.
- Jacob, M. C. M., Feitosa, I. S. and Albuquerque, U. P. 2020. Animal-based food systems are unsafe: SARS-CoV-2 fosters the debate on meat consumption. *Public Health Nutrition*, 23(17): 3250–3255.
- Jadav, S. J. and Raval, S. K. 2019. Consciousness of Dairy Farmers about Brucellosis. *International Journal of Current Microbiology and Applied Sciences*, 8(09): 1404–1415.
- Jones, K. E., Patel, N. G., Levy, M. A., Storeygard, A., Balk, D., Gittleman, J. L. and Daszak, P. 2008. Global trends in emerging infectious diseases. *Nature*, 451(7181): 990–993.
- Kelly, T. R., Bunn, D. A., Joshi, N. P., Grooms, D., Devkota, D., Devkota, N. R., Paudel, L. N., Roug, A., Wolking, D. J. and Mazet, J. A. K. 2018. Awareness and Practices Relating to Zoonotic Diseases Among Smallholder

- Farmers in Nepal. *EcoHealth*, 15(3): 656–669.
- Kendall, E. A., LaRocque, R. C., Bui, D. M., Galloway, R., Ari, M. D., Goswami, D., Breiman, R. F., Luby, S. and Brooks, W. A. 2010. Short report: Leptospirosis as a cause of fever in urban Bangladesh. *American Journal of Tropical Medicine and Hygiene*, 82(6): 1127–1130.
- Khan, K., Liaqat, S., Rasheed, S. and Kakar, I. 2018. Research Article Nexus Between Livestock Income and Rural Livelihood: A Case Study of Lasbela, Balochistan. 2008.
- Khan, M., Cao, Z., Khan, A., Kausar, S., Xiao, J. and Ud-din, N. 2020. Knowledge , attitude and practices related to Brucellosis in the people of Khyber Pukhtun Khwa Province , Pakistan. 3–6.
https://d197for5662m48.cloudfront.net/documents/publicationstatus/42262/preprint_pdf/9540dbf3dcbdf592ef84775c80bd2760.pdf
- Knight, S., Vrij, A., Bard, K. and Brandon, D. 2009. Science versus human welfare? Understanding attitudes toward animal use. *Journal of Social Issues*, 65(3): 463–483.
- Kwaghe, A. V., Vakuru, C. T., Ndahi, M. D., Abubakar, A., Iwar, V. N. and Eze, E. 2016. Proper hygiene and effective management of livestock as a Panacea for agricultural development and increase in Nigeria’s gross domestic product (GDP): A review. *CAB Reviews: Perspectives in Agriculture, Veterinary Science, Nutrition and Natural Resources*, 11(024): 1–21.
- Nga, V. T., Ngoc, T. U., Minh, L. B., Ngoc, V. T. N., Pham, V. H., Nghia, L. L., Son, N. L. H., Van Pham, T. H., Bac, N. D., Tien, T. V., Tuan, N. N. M., Tao, Y., Show, P. L. and Chu, D. T. 2019. Zoonotic diseases from birds to humans in Vietnam: possible diseases and their associated risk factors. *European Journal of Clinical Microbiology and Infectious Diseases*, 38(6): 1047–1058.
- Nilsson, C. 2005. Use of Concrete for Floors in Livestock Buildings. *Concrete for a Sustainable Agriculture – Agro-, Aqua- and Community Applications*; Swedish University of Agricultural Sciences, 25–32.
- Nyokabi, S., Birner, R., Bett, B., Isuyi, L., Grace, D., Güttler, D. and Lindahl, J. 2018. Informal value chain actors’ knowledge and perceptions about zoonotic diseases and biosecurity in Kenya and the importance for food safety and public health. *Tropical Animal Health and Production*, 50(3): 509–518.
- Pal, M., Ayele, Y., Hadush, A., Panigrahi, S. and Jadhav, V. J. 2018. Public Health Hazards Due to Unsafe Drinking Water. *Air & Water Borne Diseases*, 7(June), 1–6.
- Pham-duc, P., Id, M. A. C., Cong-hong, H. and Nguyen-thuy, H. 2019. Knowledge , attitudes and practices of livestock and aquaculture producers regarding antimicrobial use and resistance in Vietnam. *PLoS One*, 14(9): e0223115.
- Rahman, M. S., Faruk, M. O., Her, M., Kim, J. Y., Kang, S. I. and Jung, S. C. 2011. Prevalence of brucellosis in ruminants in Bangladesh. *Veterinari Medicina*, 56(8): 379–385.
- Sadharakiya, K., Sorathiya, L., Raval, A., Sabapara, G. and Patel, P. 2019. Effects of Rubber Mat Flooring on Hygiene, Locomotion, Hock and Knee Injury in Crossbred Cows. *International Journal of Livestock Research*, 0, 1.
- Saloniemi, H. 2003. Animal hygiene as a basis for public health. <https://www.isah-soc.org/userfiles/downloads/proceedings/2003/mainspeakers/12SaloniemiFinland.pdf>
- Samad, M. 2013. Public Health Threat Caused By Zoonotic Diseases in Bangladesh. *Bangladesh Journal of Veterinary Medicine*, 9(2): 95–120.
- Sasakova, N., Gregova, G., Venglovsky, J., Papajova, I., Nowakowicz-Debek, B. and Bozakova, N. 2016. Hygiene Aspects of Drinking Water Sources Used in Primary Milk Production. *Modern Environmental Science and Engineering*, 1(6): 311–317.
- Seimenis, A. and Battelli, G. 2018. Main challenges in the control of zoonoses and related foodborne diseases in the south mediterranean and middle east region. *Veterinaria Italiana*, 54(2): 97–106.
- Slingenbergh, J., Gilbert, M., De Balogh, K. and Wint, W. 2004. Ecological sources of zoonotic diseases. *OIE Revue Scientifique et Technique*, 23(2): 467–484.
- Smith, K. V., DeLong, K. L., Boyer, C. N., Thompson, J. M., Lenhart, S. M., Strickland, W. C., Burgess, E. R., Tian, Y., Talley, J., Machtinger, E. T. and Trout Fryxell, R. T. 2022. A Call for the Development of a Sustainable Pest Management Program for the Economically Important Pest Flies of Livestock: a Beef Cattle Perspective. *Journal of Integrated Pest Management*, 13(1): 14.
- Sorge, U. S., Yamashita, S. and Pieper, L. 2019. Bovine veterinarians’ perspective on organic livestock production in the USA. *Veterinary Record*, 184(12): 384.

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Sultana, R., Rimi, N. A., Azad, S., Saiful Islam, M., Salah Uddin Khan, M., Gurley, E. S., Nahar, N. and Luby, S. P. 2012. Bangladeshi backyard poultry raisers' perceptions and practices related to zoonotic transmission of avian influenza. *Journal of Infection in Developing Countries*, 6(2): 156–165.

Velasquez-Manoff M. 2012. An epidemic of absence: a new way of understanding allergies and autoimmune diseases., Simon and Schuster, 397 p.

Wolfe, N. D., Dunavan, C. P. and Diamond, J. 2007. Origins of major human infectious diseases. *Nature*, 447(7142): 279–283.