

Status: Preprint has been submitted for publication in journal

One Health of Peripheries: biopolitics, social determination and field of praxis

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<https://doi.org/10.1590/SciELOPreprints.2019>

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Submitted on (YYYY-MM-DD): 2021-03-22

Posted on (YYYY-MM-DD): 2021-03-29

1 **One Health of Peripheries: biopolitics, social *determination* and field of**
2 **practice**

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16
17 **Abstract**

18 Amid the urgency to solve countless and severe health problems, asking what is health or who can
19 and must have it may seem like a waste of time. However, some responses can reveal prevailing
20 practices that divert attention from fundamental problems, thus maintaining privileges and deepening
21 health inequities. One Health of Peripheries arises from these questions and takes form in three
22 interdependent dimensions. The first refers to processes, states, resources, capabilities, and attributes
23 of peripheral multispecies collectives and the environments they comprise. The second
24 problematizes marginalizing apparatuses that define health and who can and should have it. The third
25 encompasses practices in more-than-human social spaces and symbolic structures in which, and
26 through which, One Health is experienced, understood, and transformed. The qualification of health
27 as “one” does not refer to the lack of plurality, nor to the simple aggregation of health fragments
28 (human + animal + environmental), but to the complexity of health in a field with peripheral places,
29 ensuing from margins to privilege those who are inside and legitimize the exploitation of those who
30 are outside. Symbolic margins distribute individuals into categories of species, race, ethnicity,
31 gender, social class, and capability, among others, whereas geographic margins are visible in
32 different territorial tessellations. The synergism and antagonism among margins create degrees of
33 privilege and vulnerability that materialize epidemiologic profiles. Social *determination*, a key
34 concept in the (Latin American) collective health movement, underlies such profiles. However, this
35 movement overlooks the more-than-human dimension of social determination; that is to say, One
36 Health of Peripheries is a blind spot of collective health. The cartography of One Health of
37 Peripheries has unique needs regarding participation, research, and inclusive policies for the
38 decolonial promotion of healthy lifestyles.

39
40 **Keywords: One Health of Peripheries, One Health, Collective Health, Critical Epidemiology,**
41 **Determinants of Health, Health Inequities, More-than-human Biopolitics, Critical Animal**
42 **Studies**

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48 1 Introduction

49 What is health, who can be healthy, and what are the most pressing health issues? I will argue that
50 prevailing answers so far have been biased by struggle, cooperation, and imposition to shape and
51 legitimize hierarchies according to the interest of the most privileged hierarchical positions.

52 Conceptual frameworks about the social *determination* of health (1,2) and the social determinants of
53 health (3) consider social hierarchies, giving us insights and tools to oppose specific health inequities.
54 However, one of my claims in this manuscript is that at the same time, these frameworks ignore and
55 reproduce marginalizing apparatuses that materialize health inequities.

56 These apparatuses establish margins and create symbolic and geographic peripheries. Subaltern
57 countries, indigenous territories, favelas. Gender, race, ethnicity, class, species, capability.

58 Marginalizing apparatuses legitimize the idea that some historically excluded (peripheral) individuals
59 are simply less valuable by their kind; their exploitation is justified because they lack the supposed
60 essence that dominant groups have.

61 The (Latin American) collective health field (4) excludes nonhuman animals (hereafter animals). At
62 most, it includes them due to their instrumental value to prevent and control specific human health
63 problems. Animals do not figure as health bearers or in any other explicit form in its conceptual
64 frameworks about the social determination of health. Although such exclusion is common to different
65 health perspectives, I will focus my critic on the collective health field because it is one of the main
66 influences on One Health of Peripheries.

67 Is the exclusion of animals from the field of collective health justified? I will conclude that it is not.
68 The bourdieusian's approach that supports this field (4) and critical analysis of social hierarchies
69 (5) also shows, together with other perspectives, the more-than-human dimension of social
70 entanglements (6–9). Moreover, concerns with health inequities can be better addressed considering
71 theories of multispecies justice (10), while labor perspectives of health [see Almeida-Filho's
72 discussion about Laurell's works (11)] could be updated by more-than-human labor theories (12).

73 Health is not exclusively human, as demonstrated by the overwhelming One Health scientific
74 evidence about the human-animal-environment interface (13). One Health is supported by
75 intersectoral and international initiatives due to its pertinence to address pandemics, bioterrorism,
76 food-borne diseases, and significant health problems expected to worsen, such as antimicrobial
77 resistance (13,14). However, One Health approaches often restrict their focus to biological aspects of
78 transmissible diseases.

79 The biologism in One Health has remarkable exceptions (15–21). Here I propose another one: One
80 Health of Peripheries. I rethink One Health from the perspective of Latin American collective health
81 and more-than-human biopolitics.

82 The following sections of the manuscript sketch the emerging field of One Health of Peripheries. A
83 field requiring new practices and policies as well as including other actions already existing but
84 applied elsewhere. Notwithstanding the relevance, my objective here is not to address specific
85 procedures to conduct health practices or concrete recommendations to guide health policies.
86 Moreover, I discuss the decolonial perspective of One Health of Peripheries in a another manuscript
87 (22). That said, the *more-than-human biopolitics* section locates marginalizing apparatuses in a
88 broader biopolitical field. It then outlines the role of one of its tactics (animalization) in the
89 establishment and operation of hierarchies that determine epidemiologic profiles. The *One Health*
90 section rethinks One Health and draws initial cartography of its peripheral regions. The *social*
91 *determination of health* section briefly compares the concepts of social determination of health and
92 social determinants of health. From this comparison and the previous sections, I extend the idea of
93 triple inequity of health to include other forms of inequities and their interactions, with particular
94 attention to species-based inequities. The *field of praxis* section is based on Bourdieu's concepts of
95 *habitus* and *field* and Freire's understanding of praxis. In this section, I frame One Health of
96 Peripheries as a blind spot of collective health. Finally, I present some concluding remarks.

97

98 **2 More-than-human biopolitics**

99 Biopolitics addresses new forms of power or aspects of power previously unknown, in the context of
100 phenomena as diverse as concentration camps, migratory processes, cognitive capitalism,
101 domestication, sovereignty, the immunitary paradigm of modern politics, the relationship of humans
102 with others animals and with technology, the state of exception, and power/knowledge relationships
103 (23,24,33,25–32). Such diversity brings ambivalence and contradiction as well as negative
104 (marginalizing, excluding, repressing) and positive (affirmative, productive, empowering)
105 perspectives. Biopolitics shows the blurring of the public/private boundary, the politics on life and of
106 life, the administration of populations, the production of profitable and docile bodies, and
107 marginalizing apparatuses underlying hierarchies (25,31,34).

108 Delimitation is a requirement for exclusion and exploitation within society. Therefore, importance is
109 attributed to those within the limits because they belong, and importance justifies moral
110 consideration, making it acceptable to exploit those on the other side of the margin, on the periphery.
111 The authorities of delimitation (35)—“including philosophical, religious, scientific and legal”—both
112 delimit and authorize margins and legitimize their practices (36). As one can read in Derrida (37), the
113 original marginalization is constitutive of the socialization of “human culture and of politics itself”; it
114 is a marginalization that leaves animals on the periphery and allows their domestication. Such
115 domestication gives rise to disciplinary and violent regimes (36) and to population technologies for
116 the administration of life. It becomes a model of exploitation and establishes the basis of a hierarchy,
117 reserving the apex for the “Western-man” (36).

118 After legitimizing domestication, animalization serves to form and reinforce other hierarchical levels.
119 The lacking rationality of mad people animalizes and justifies their confinement and physical
120 restraint (36,38). The enslaved black is an exotic animal or might be, by far, a link between animals
121 and civilized men; the animalization of black women reduces her to a reproductive body susceptible
122 to “violation with impunity” (36). Nowadays, racism and machismo continue to use animalization. In
123 Brazil, for instance, blacks are compared to monkeys, non-heteronormative men to animals (*bicha*),
124 and women to cows. Despite its aporia, animalization of human animals continue to silence the
125 sentence, sociability, and subjectivity of nonhuman animals.

126 Marginalizing apparatuses such as racism, machismo, classism, capabilism, and speciesism impose
127 health inequities. Their overlap, synergism and antagonism, their so-called intersectionality (39,40),
128 give rise to further categories of privilege and vulnerability (middle-class transsexual, companion
129 mouse, white man from the favela, farm animal, stray bitch) associated to epidemiologic profiles that
130 are not properly addressed within current health systems.

131

132 **3 One Health**

133 One health traditionally refers to the inextricable relationship between human, animal, and
134 environmental health. It is a concept growing in popularity and application due to the increasing
135 awareness regarding many human diseases with an animal origin and the multiple diseases that
136 remain zoonotic; from AIDS to dengue and COVID-19, from visceral leishmaniasis to tuberculosis
137 and influenza A (41–43). According to the World Organization for Animal Health (OIE), 60% of
138 human infectious diseases are zoonotic, 75% of emerging human infectious diseases originate from
139 other animal species, and 80% of agents with bioterrorist potential are zoonotic (14). Neglected
140 tropical diseases are mostly zoonotic or vector-borne (44) and affect more than a billion people
141 (45) as well as a high number of animals. Neglected tropical diseases are a priority recognized by the
142 World Health Organization (WHO) Assembly 66.12 of 2013, which recommended One Health
143 approaches to their member States (46) to tackle its uncontrolled spread. In the face of growing
144 global concern about emerging and re-emerging zoonoses and antimicrobial resistance due to

145 indiscriminate overuse of antibiotics in human populations and other species, One Health catalyzed
 146 the tripartite union between the WHO, the OIE, and FAO (13).

147 One Health is often represented as three partially intersected sets (human, animal, environment).
 148 Thus, although humans and animals are *within* the environment, part of the human and animal sets is
 149 outside the environment. Furthermore, the partial intersection between the human and animal
 150 domains is incongruent with evolutionary theory since humans are animals. Of course,
 151 representations can emphasize different issues; however, there is no need to leave part of the sets out
 152 of the intersection. Subsumption serves to represent the relationships and is in line with the
 153 inclusiveness required to promote One Health of Peripheries.

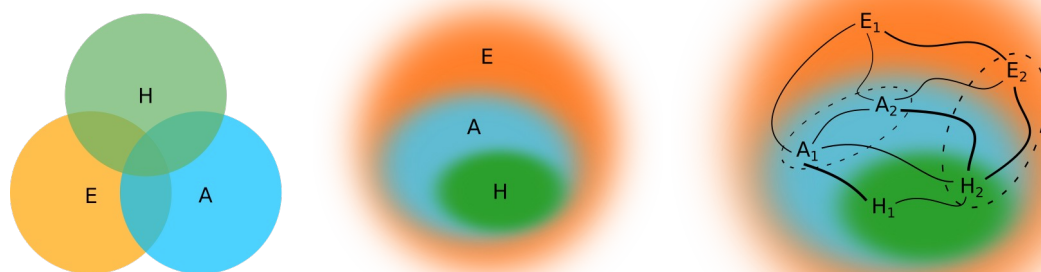
154 One Health of Peripheries, does not dogmatically cut animal taxonomy to leave the human species on
 155 one side, and a wide variety of species on the other side (Figure 1). Instead, there are multispecies
 156 collectives whose species-specific constitution depends on the health phenomenon in question; the
 157 division of animal taxonomy into “human” and “animal” is understood as a tool that may have
 158 didactic and strategic values and serve as semantic abbreviation; however, the uncritical use of this
 159 tool conflates the division with a constant of “nature” and hides its biopolitical consequences.

160 Moreover, the environment is not understood as an external domain related or partially intersected by
 161 the human and animal domains. It is composed of multispecies collectives *and* other agents, in the
 162 sense actor-network theory gives to agency (7); the environment is a set of relations and agents
 163 located by them; entanglements; agents that even as “individuals” reveal internal environments of
 164 microbiota, that is to say, agents within agents. It is an environment without the dual ontology
 165 separating “human society” and “nature” (7,9,47,48).

166

167

168 Figure 1. Comparison between the conventional (left) and the proposed (simplified at the middle)
 169 schemes of One Health.



170 The conventional scheme partially intersect human, animal, and environmental health. In the proposed scheme of One
 171 Health, there is subsumption (*One Health*, inclusiveness, internal environments with blurred boundaries), differentiated
 172 relations (edges of different thickness), and plurality (indexed elements). a: nonhuman animal
 173 (species/collectivity/individual/intraindividual); h: human-animal (collectivity/individual/intraindividual); and e:
 174 vegetables, other living beings, inanimate agents (species/collection/individual/intraindividual). Dashed boundaries show
 175 that there are many configurations for multispecies collectives.

176

177 An initial, non-exhaustive cartography of One Health of Peripheries includes neglected diseases,
 178 domestic violence, geographic peripheries, homelessness, and agribusiness externalities. Having
 179 contextualized the neglected diseases above, I turn now to other regions of such cartography.

180

181 3.1 Domestic Violence

182 Violence is a cause of morbidity and mortality, and among the approaches to address its complexity,
183 it is the prevention of violence against animals. Conviviality with companion animals is growing, and
184 in some countries, there are more dogs and cats than children in households (49,50). In multispecies
185 homes, animals enter into family dynamics and can be victims of domestic violence. The violence
186 against them is related to the violence against children and women (51–55). In addition to victims,
187 animals are instruments of coercion used by perpetrators to cause more suffering and control their
188 human victims (56–60).

189 Domestic violence does not stem exclusively from individual psychological factors. Lifestyles,
190 conditioned by processes of social reproduction, favor or protect against domestic violence,
191 depending on their configuration. Therefore, it is important to consider the relationship between
192 social vulnerability, interpersonal violence, and violence against companion animals (61–65).

193 The investigation of violence against animals helps to detect domestic violence cases involving
194 several victims and broadens the understanding of the perpetrators' psychological profile (54).
195 Furthermore, animals can promote collective care and self-care to counter violence (66,67).
196 However, the effective prevention of domestic violence must address social vulnerability and its
197 social determination, in the broad sense, without being restricted to economic poverty and exploring
198 underlying marginalizing apparatuses. Domestic violence in One Health of Peripheries is socially
199 determined, affects humans and animals, and has institutionalized dimensions.
200

201 **3.2 Geographic peripheries**

202 Geographic peripheries are heterogeneous, encompassing countries, areas circumscribed within
203 countries, and cross-border regions such as rural areas, indigenous territories, and favelas. Taking the
204 last as an example, we can see how geographic marginalization also circumscribes epidemiologic
205 profiles. *Favela* is a term with pejorative connotations, unsolved by euphemisms. It refers more
206 directly to the geographically delimited precariousness ensuing from the historical exploitation and
207 concentration of wealth. Simultaneously, its polysemy points to the constant meaning-making and
208 remaking from within; to the place from which resistance, creativity, and sensitivity produce other
209 epistemologies and lifestyles. The favelas challenge conventional census methods and thus receive
210 differentiated treatment, starting from their identification. For instance, the Brazilian Institute of
211 Geography and Statistics (IBGE) defines favelas as places with at least 51 housing units irregularly
212 occupied, under urban irregularities, or lacking essential public services (68). It calls them subnormal
213 agglomerates. Census definitions, although limited, give an idea of quantity. There were 6329 favelas
214 in which 6% of the Brazilian population lived in 2010. The State of São Paulo had the highest
215 concentration of households in favelas (23.2%), including approximately 11% of its metropolitan
216 population (68). Thus, health problems affecting favelas compromise millions of individuals in the
217 country. Globally, projections suggest that in 2030 the human population will be 8.1 billion, 5 billion
218 (61.7%) will live in urban areas, and 2 billion (24.7%) will live in favelas (69).

219 The neglect of favelas continues worldwide. The health in favelas is different from the urban health
220 and health in poverty because not all people living in favelas are poor, and not all poor people in
221 cities live in them (70). The favelas' contextual effects on health are mediated by imposed risks and
222 the lack of resources (money, time, infrastructure, knowledge), establishing a vicious circle of
223 vulnerability due to the increased burden of diseases that compromises the individuals' opportunities
224 for economic and social inclusion.

225 The favelas' contextual effects impinge on multispecies collectives, and this is even more neglected.
226 Animals are exposed and vulnerable to pollution, humidity, darkness, insufficient ventilation,
227 malnutrition, and high population densities. There is a need to promote animal health for the sake of
228 the animals but also for the sake of humans living with them. The life cycle of animals is shorter than
229 in humans. Its monitoring contributes to the early detection of chronic diseases and other health
230 problems resulting from exposure to unhealthy environments (71,72). As favelas' boundaries are not

231 hermetic and do not entirely restrict their contextual effects, improving their health reflects outside
232 them. Favelas are peripheral but not isolated. Turning favelas into healthy places reduce infectious
233 diseases, the need to use antibiotics, and thus antimicrobial resistance, one of the top ten global health
234 problems according to the WHO. But as with any periphery, that turn requires structural changes, the
235 dismantling of the underlying marginalizing apparatuses.

236

237 **3.3 Homelessness**

238 “Homelessness” usually refers to the condition of humans without a permanent residence, a dynamic
239 situation that can vary from one day to a lifetime, depending on the availability of social and
240 economic resources to have access to such permanent residence.

241 Homelessness is a structural problem of social organization around private property. However, it also
242 results from other processes, such as the abandonment of homes to escape domestic violence or home
243 dynamics incompatible with drug abuse, psychiatric illnesses, and other conditions.

244 In addition to humans, companion animals can turn homeless due to abandonment or because they
245 got lost. They may be born homeless, remaining as such for the rest of their lives or until rescue.

246 Dogs and cats are still properties, and therefore their homelessness also represents a private property
247 problem. On the one hand, the legal consequences of abandoning an animal property might not be
248 sufficiently persuasive. On the other hand, the property status might reduce and even eliminate the
249 moral responsibility regarding animal abandonment.

250 Although the processes that lead humans and companion animals to homelessness are different, some
251 effects are similar regardless of the species. Homeless individuals suffer abuse. Adversities (climatic,
252 nutritional, emotional) cause suffering and compromise the immune system, thus adding to the lack
253 of hygiene that predisposes to infectious diseases, worsened by the lack of access to health services.

254 In their marginalized condition, homeless humans and dogs find each other and create emotional
255 bonds (73,74). Humans even prioritize dogs when sharing available food (75), and may prefer to
256 remain on the streets than stay overnight in places that do not accept their canine companions (76).
257 Citing Sakelaropoulos et al. (77), Taylor describes the humans’ emotional bonds with cats and even
258 rats (74). The latter and other synanthropic species live on public spaces and pose specific challenges
259 that increase the health complexity of multispecies collectives living on the streets.

260 Direct actions on homeless multispecies collectives could involve networks of shelters and adoption
261 programs for humans (mainly children in the case of adoption) and companion animals, as well as
262 contraceptive and “humanitarian” elimination programs for synanthropic populations. These actions
263 complement but do not replace integrated approaches of health promotion and disease risk
264 prevention.

265 Regardless of their species, the homeless are members of the living cities conceptualized in critical
266 geography (78). One Health in the urban context turns out to be the health of these living cities, and
267 their improvement demands special considerations about homelessness. First, promoting lifestyles as
268 opposed to the conditions that lead humans and companion animals to homelessness. Second, urban
269 planning to promote biodiversity; planning for the so-called recombinant ecosystems, for the so-
270 called green cities (78,79).

271

272 **3.4 Agribusiness externalities**

273 Ending hunger is one of the United Nations’ Sustainable Development Goals (80). Agribusiness has
274 responded to such a goal by intensifying production, reducing food prices, generating jobs, and
275 contributing to Gross Domestic Product (GDP). However, qualifying that response requires taking
276 externalities into account. Although some of these are gaining visibility, others remain peripheral.

277 The Intergovernmental Panel on Climate Change (IPCC) concluded, with a high level of confidence,
278 that “climate change is expected to lead to increases in ill-health in many regions and especially in
279 developing countries with low income, as compared to a baseline without climate change” (81).

280 Greenhouse gases (GHG) are the leading cause of climate change (82), and farm animals are the
281 largest source in agriculture (83). Furthermore, single-crop farming is another source of GHG itself.
282 Its expansion often leads to more emissions due to the intensification of farm animal production to
283 compensate for the loss of pastures (84).

284 The expansion of agricultural frontiers reduces biodiversity and increases the risk of many zoonoses
285 occurrence (85). However, zoonoses control proposals are typically biomedical or focused on
286 proximate risk factors. They hardly question the food production systems' *status quo*, thus losing the
287 opportunity to find more favorable scenarios in terms of zoonoses, preservation of biodiversity, and
288 other externalities.

289 Water consumption and pollution are other externalities of agribusiness. In Brazil, for example, it is
290 estimated that land irrigation consumes 72% of the country's water supply (86), and feeding farm
291 animals consume 79% of the cultivated protein (87). Simultaneously, the water network did not serve
292 33.2 million people in 2018 (88). In animal production systems, sources of water pollution include
293 pharmaceutical residues (including antibiotics), heavy metals, chemicals, excrement, and pathogens;
294 as for crops, in addition to heavy metals and chemicals, pesticides with carcinogenic potential are of
295 particular concern (89).

296 Agribusiness creates jobs and contributes to GDP. However, it matters what kind of jobs, in a context
297 of employees with little bargaining power against growing oligopolies (90,91). For instance, in
298 subaltern countries, subsidies persuade smallholders to submit themselves to exploitation by
299 transnational corporations at the expense of agrarian reforms to promote diversified agriculture
300 equitably (90,91). Meanwhile, in rich countries, unhealthy conditions in intensive production systems
301 difficult the recruit domestic workers, which has been circumvented by hiring immigrants, including
302 those who are not authorized to work. (92,93).

303 Unhealthy work can occur for several reasons. In the production of fruits and vegetables, pesticides
304 are potential carcinogens (89,94,95). In intensive animal production systems, toxic gases, vapors, and
305 particles pollute the air and cause respiratory diseases (96–98). Farm environments and
306 slaughterhouses can predispose to physical trauma, depression, and drug use (93,99). Stressful and
307 overpopulated environments also predispose to animal diseases, and their treatment with antibiotics
308 results in antimicrobial resistance affecting human workers and their families (100–103). In
309 slaughterhouses, the mass killing of animals is a violent job that can affect the employees' mental
310 health and has been causally linked to increased crime rates in communities neighboring such
311 slaughterhouses (104).

312 The externalities on farm animal wellness have been explored elsewhere (91,105). Here I want to
313 emphasize that despite recent theoretical advances on multispecies justice and labor issues involving
314 animals (10,12), forcing animals to produce continues without considering labor rights for them.
315 Farm animals are subjected to a commodification strategy that transforms the violence perpetrated on
316 sentient beings into procedures to increase production efficiency.

317 While happy farm animals appear in bucolic images (in children's books and meat packages) and Ag-
318 gag laws prevent the investigation and disclosure of animal abuse (106,107), the real farm animals
319 are pushed to their physiological limit, constantly expanded by genetic, medical, and
320 pharmacological technologies. Billions of these animals are slaughtered, requiring hasty procedures
321 that challenge labor safety and animal suffering mitigation. Moreover, cruelty procedures continue in
322 use: male chicks shredded alive when the objective is egg production; sows housed in cells that
323 prevent them from turning their bodies; small cages that do not allow birds to extend their wings;
324 prematurely broken mother-offspring bonds; routine amputation and without anesthesia of beaks,
325 teeth, horns, and tails to increase confinement density and avoid cannibalism ensuing from the
326 stressing environment.

327 Agribusiness produces externalities protected by strategies of governmentality (91). It destroys the
328 environment and uses cruel methods against animals. Simply talking about job creation and GDP

329 contribution does not say anything about the working conditions or the profit distribution.
330 Externalities, including subsidies, outweigh the final prices paid by consumers of agribusiness'
331 commodities and threaten global sustainability.
332

333 **4 Social determination of health**

334 There are discussions about health complexity beyond biomedical issues. In Latin America, social
335 medicine (nowadays collective health and critical epidemiology) has developed conceptual
336 frameworks for the social determination of health since the 1970s. After the turn of the century, the
337 WHO has popularized a conceptual framework of the social determinants of health. Despite
338 criticisms from critical epidemiology to the WHO proposal for being in practice more complicit with
339 the *status quo* structuring inequities (1,108,109), both positions point to the need to transcend
340 biologism and individualism in health, but they also reduce the social to the human domain.
341 However, some approaches to One Health show that such reduction is misleading (19,41,110),
342 whereas biopolitics and sociology set background to think a more-than-human social determination
343 of health (6–8,33,111–113).

344 In the WHO's conceptual framework, structural determinants create health inequities through
345 intermediary determinants (3). The structural determinants refer to the mechanisms by which
346 political, economic, and social contexts generate "hierarchies of power, prestige, and access to
347 resources" (3). The intermediary determinants are material and psychosocial circumstances,
348 behavioral and biological factors, and the health system itself; they are a consequence of individuals'
349 hierarchical positions. They are also the cause of exposures and vulnerabilities leading to health
350 inequities (3).

351 The concepts of social cohesion and social capital link structural and intermediary determinants while
352 the health state affects individuals' opportunities and thus feedback into the hierarchical structure (3).
353 In short, it is a conceptual framework of causal nature where structural determinants have a position
354 of precedence and prominence. The identification and measurement of the hypothetical effect of
355 causal factors inform decision-making to reduce health inequities.

356 The social determination of health theorized in Latin America is not synthesized in a single reference.
357 However, a common feature of different perspectives is that social determination is a category of
358 critical analysis (1,2,114,115). According to Samaja, social determination is a historical and ongoing
359 process through which social hierarchy levels are "self-produced and reproduced, generating tensions
360 and conflicts that motivate actions of restoration and transformation" (115) [the translation is mine].
361 A given hierarchical level *reproduces* itself as a whole, regulating its parts (levels subsumed by it) to
362 maintain the whole structure (115). However, the regulation is not absolute, and the relative
363 autonomy of the parts is a source of change that *produces* new wholes (levels subsuming them)
364 (115).

365 In this dialectic movement between regulation and relative autonomy, healthy and unhealthy forces
366 configure epidemiologic profiles characteristic of the different hierarchical levels and positions
367 within the levels (114). For instance, the family is one of such levels. The relative autonomous
368 lifestyles of family members, as well as the regulations from higher social organization levels
369 (community, political-administrative territorial divisions, contractual associations, and other
370 institutions), determine their epidemiologic profile.

371 Despite fundamental differences between the two conceptual frameworks, they intersect at two
372 points. Both identify a structural dimension (socioeconomic and political context in the social
373 determinants; social production and reproduction in the social determination) and the ensuing
374 hierarchy that imposes constraints on individuals according to their hierarchical position. Both point
375 to the triple inequity of health determined by class, gender, and race/ethnicity.

376 One Health of Peripheries also intersects these points. The first from a biopolitical perspective in
377 which the political is neither an external precursor of hierarchies nor an instrument monopolized by

378 the most privileged hierarchical levels. The political is the relationships among individuals, the
379 hierarchical order itself, it is realized and not owned, it is the foucauldian micro-physics of power
380 (116) involving animals. Therefore, One Health of Peripheries participates in the second intersection
381 in its theorizing of multispecies forms of health inequity.

382 Structural One Health is another helpful reference that goes beyond proximate causes to explore the
383 crucial role of agribusiness in the production of zoonoses and pandemics through circuits of capital
384 (41). However, it is worth noting that structural One Health and One Health of Peripheries differ.
385 First, there is a difference of scope because One Health of Peripheries extends beyond infectious
386 diseases. Second, structural One Health stresses more extensive empirical causal processes, whereas
387 One Health of Peripheries agree with the need for more comprehensive causal explanations but
388 stresses dialectical process to overcome the limitation of causal reasoning and empirical evidence.
389 Third, power relations and health inequities are explicit multispecies phenomena in One Health of
390 Peripheries.. It is beyond the scope of this manuscript to explore the details of the social
391 determination of One Health of Peripheries, so I will leave that for future works.
392

393 **5 Field of praxis**

394 Field and *habitus* are bourdieusian concepts incorporated in collective health. From them, we can
395 think about health practices and knowledge as elaborated by subjects conditioned by symbolic
396 structures like language and culture that allow and shape their representations. Therefore, health is
397 for health practitioners what they can know about it, so transforming the conditions that make
398 knowledge possible changes health. In other words, the transformation of symbolic structures is also
399 a health practice and affects health.

400 Practices are produced, perceived, and appreciated by *habitus*, a system of schemes “constituted in
401 the course of collective history and acquired [and transformed] in the course of individual history”
402 (5,117) [the translation is mine]. Individuals’ *habitus* depends on hierarchies, so individual’s
403 perceptions, knowledge, and practices reveal their position and shape their relationships with
404 individuals in other hierarchical places.

405 The field is the social space constituted by hierarchical relationships that condition the *habitus* and
406 gain from this its meaning and value (118). In the field, cooperation and conflict preserve or
407 transform hierarchies. The most privileged positions have more capital—economic, cultural, social,
408 and symbolic—to shape and legitimize hierarchies according to their interests. These interests are not
409 necessarily conscious because, as part of the *habitus*, they are inculcated in “institutionalized spaces
410 (family, school) by specialized agents who impose arbitrary norms using disciplinary techniques” (5)
411 [the translation is mine].

412 Peripheral positions “intervene as a passive, contrasting reference point” (5) [the translation is mine].
413 Here is again the contrasting position of animals; those who want more capital to fight and legitimize
414 their interests need a “social promotion experienced as an ontological transformation or as a process
415 of civilization, a leap from nature to culture, from animality to humanity” (5) [the translation is
416 mine].

417 Depending on the *habitus* and the field, one will see, among others, unfitted mads who deserve their
418 misfortunes, or psychiatric patients who can become more productive when receiving treatments
419 provided by the pharmaceutical industry, or unhealthy exploitation regimes by way of progress. One
420 will see pests and reservoirs of infectious agents that threaten public health, or multispecies
421 collectives sharing susceptibilities, in need of comprehensive health policies. Therefore, what enters
422 into the health field and the way it enters is a social process.

423 Health practice is not neutral and can reinforce inequities. On the contrary, promoting One Health of
424 Peripheries is an explicit commitment to reduce more-than-human inequities. Thus, the field of
425 practice for such promotion is more specific; it is a field of praxis. Here I take praxis from Paulo
426 Freire as reflexive action against oppression, towards liberation (119). Praxis as action informed by

427 knowledge about the pathological effects of marginalization and knowledge built on actions against
428 marginalization.

429 In the field of collective health, there is extensive reference to “health promotion” and “life
430 preservation” (120), non-anthropocentric perspectives (1), and “diversity of objects and theoretical
431 discourses, without recognizing any hierarchical and evaluative perspective about them” (121) [the
432 translations are mine]. However, any generic reference to life or health is systematically pointed to
433 the human, overlooking that life and health are more-than-human. This is a blind spot of collective
434 health, brought to light by the praxis of One Health of Peripheries.

435 As a subfield of health, collective health does not need to cover everything that concerns health, and
436 in this sense, it could be limited to the human. However, if collective health is transdisciplinary
437 (122), concerned with the social determination of health (1) and aims at the “production of an
438 expanded knowledge of health” (123) [the translation is mine] it should promote One Health of
439 Peripheries.

440

441 **6 Conclusion**

442 One Health of Peripheries is experience, understanding, and transformation to improve the wellness
443 of multispecies collectives subjected by marginalizing apparatuses. It is about breaking the margins
444 for better health.

445 The emphasis on these apparatuses might have given the impression that biopolitics is inherently bad.
446 However, it is worth noting that positive and negative biopolitical perspectives do not necessarily
447 refer to good and bad consequences, respectively. Promoting One Health of Peripheries, is in a sense,
448 a biopolitical exercise.

449 The proposed One Health graphic scheme improves logical consistency and at the same time stresses
450 inclusiveness, different relations, and plurality. It also allows for multispecies collectives whose
451 composition depends on the health phenomenon of interest. Whereas guidelines defining One Health
452 gold standards require human, animal, and environmental data (124), One Health of Peripheries is the
453 praxis against the multispecies collectives’ marginalization. It is impossible to exclude humans from
454 a praxis framed in the social determination of health, but that does not mean that data from human
455 subjects is always necessary. Similarly, peripheries imply environments, but they are more than
456 physical spaces subject to measurements. The ecology of knowledge is a more pertinent reference for
457 the decolonial promotion of One Health of Peripheries, and I explore that in another manuscript (22).

458 The extension of One Health beyond (not the negation of) biomedicine and modern epidemiology,
459 while taking marginalizing apparatuses as a critical category, opens the field to health promotion and
460 centralizes the problem of the multiple and more-than-human health inequities. Regarding
461 peripheries, the outlined cartography is by no means exhaustive. Due to space constraints, I omitted
462 relevant aspects of the cartography, even entire peripheries, leaving them for future works.

463 One Health of Peripheries enriches the understanding of the social determination of health, finds a
464 reference in existing perspectives, and broadens the possibilities to explore the complexity of this
465 determination. It can not continue as a blind spot of collective health. In line with the dialectical
466 movement between the collective and the individual, One Health of Peripheries should encompass
467 the structuring of intersectional and intersectoral policies and the embodiment of healthy lifestyles in
468 everyday experiences.

469

470 **7 Conflict of Interest**

471 *The author declares that the research was conducted in the absence of any commercial or financial*
472 *relationships that could be construed as a potential conflict of interest.*

473

474 **8 Funding**

475 Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES, Coordination for the
476 Improvement of Higher Education Personnel).

477

478 **9 Acknowledgments**

479 I am grateful to the multispecies community of the São Remo favela (São Paulo, SP, Brazil). At the
480 University of São Paulo, I acknowledge the One Health of Peripheries network (Saúde Única em
481 Periferias – SUP-USP) and the Research group on Peripheries (nPeriferias-IEA-USP). I especially
482 acknowledge Professor Flavia Mori Sarti for her comments to improve the reading of the manuscript.
483

484 **10 References**

- 485 1. Breilh J. La determinación social de la salud como herramienta de transformación hacia una
486 nueva salud pública (salud colectiva). *Rev Fac Nac Salud Pública* (2013) **31**:13–27. Available
487 at: http://www.scielo.org.co/scielo.php?script=sci_arttext&pid=S0120-386X2013000400002
488 [Accessed November 4, 2019]
- 489 2. Breilh J. *Critical epidemiology and the peoples' health*. New York: Oxford University Press
490 (2021).
- 491 3. Solar O, Irwin A. A conceptual framework for action on the social determinants of health.
492 World Health Organization. Geneva (2007).
- 493 4. Vieira-da-Silva LM. *O campo da saúde coletiva: gênese, transformações e articulações coma*
494 *reforma sanitária*. Salvador: Editora da UFBA, Editora Fiocruz (2018).
- 495 5. Guerra Manzo E. Las teorías sociológicas de Pierre Bourdieu y Norbert Elias: los conceptos de
496 campo social y habitus. *Estud Sociológicos* (2010) **28**:383–409.
- 497 6. Bujok M. Animals, Women and Social Hierarchies: Reflections on Power Relations. *Deport*
498 *esuli, profughe* (2013) **23**:23–47.
- 499 7. Sayes E. Actor-Network Theory and methodology: Just what does it mean to say that
500 nonhumans have agency? *Soc Stud Sci* (2014) **44**:134–149. doi:10.1177/0306312713511867
- 501 8. Pyyhtinen O. *More-than-Human Sociology: A New Sociological Imagination*. New York:
502 Palgrave Macmillan (2016).
- 503 9. Haraway D. *Staying with the trouble. Making kin in the Chtulucene*. Durham and London:
504 Duke University Press (2016).
- 505 10. Nussbaum M. *Frontiers of Justice: Disability, Nationality and Species Membership*.
506 Cambridge: Harvard University Press (2003).
- 507 11. Almeida-Filho N. Modelos de determinação social das doenças crônicas não-transmissíveis.
508 *Cien Saude Colet* (2004) **9**:865–884. doi:10.1590/s1413-81232004000400009
- 509 12. Blattner CE, Coulter K, Kymlicka W. *Animal Labour: A New Frontier of Interspecies*
510 *Justice?*. Oxford: Oxford University Press (2020).
- 511 13. WHO, OIE, FAO. Taking a Multisectoral, One Health Approach: A Tripartite Guide to
512 Addressing Zoonotic Diseases in Countries. (2019).

- 513 14. OIE. World Organization for Animal Health: One Health. (2020) Available at:
514 <https://www.oie.int/en/for-the-media/onehealth/> [Accessed February 7, 2020]
- 515 15. Davis A, Sharp J. Rethinking One Health: Emergent human, animal and environmental
516 assemblages. *Soc Sci Med* (2020) **258**:113093. doi:10.1016/j.socscimed.2020.113093
- 517 16. Friese C, Nuyts N. Posthumanist critique and human health: how nonhumans (could) figure in
518 public health research. *Crit Public Health* (2017) **27**:303–313.
519 doi:10.1080/09581596.2017.1294246
- 520 17. Rock MJ. Who or what is ‘the public’ in critical public health? Reflections on posthumanism
521 and anthropological engagements with One Health. *Crit Public Health* (2017) **27**:314–324.
522 doi:10.1080/09581596.2017.1288287
- 523 18. Nading AM. Humans, Animals, and Health: From Ecology to Entanglement. *Environ Soc*
524 (2013) **4**:60–78. doi:10.3167/ares.2013.040105
- 525 19. Craddock S, Hinchliffe S. One world, one health? Social science engagements with the one
526 health agenda. *Soc Sci Med* (2015) **129**:1–4. doi:10.1016/J.SOCSCIMED.2014.11.016
- 527 20. Brown H, Nading AM. Introduction: Human Animal Health in Medical Anthropology. *Med*
528 *Anthropol Q* (2019) **33**:5–23. doi:10.1111/maq.12488
- 529 21. Lainé N, Morand S. Linking humans, their animals, and the environment *again* : a decolonized
530 and more-than-human approach to “One Health.” *Parasite* (2020) **27**:55.
531 doi:10.1051/parasite/2020055
- 532 22. Baquero OS, Fernández MNB, Aguilar MA. From modern Planetary Health to decolonial
533 promotion of One Health of Peripheries. *SciELO Prepr* (2021)
534 doi:<https://doi.org/10.1590/SciELOPreprints.2053>
- 535 23. Agamben G. *Homo sacer: sovereign power and bare life*. Translated by Daniel Heller-
536 Roazen. Stanford University Press (1998).
- 537 24. Asdal K, Druglito T, Hinchliffe S. *Humans, Animals and Biopolitics: The more-than-human*
538 *condition.* , eds. K. Asdal, T. Druglito, S. Hinchliffe New York: Roudlege (2016).
- 539 25. Bazzicalupo L. *Biopolítica: Um mapa conceitual*. Translated by Carlos Alberto Gianotti. Sao
540 Leopoldo (2017).
- 541 26. Chrulew M, Wadiwel DJ. *Foucault and Animals.* , eds. M. Chrulew, D. J. Wadiwell Leiden:
542 Brill (2016).
- 543 27. Esposito R. *Immunitas: The Protection and Negation of Life*. Translated by Timothy
544 Campbell. Minneapolis: Polity (2011).
- 545 28. Esposito R. *Bios: Biopolitics and philosophy*. Translated by Timothy Campbell. Minneapolis:
546 University of Minesota Press (2008).

- 547 29. Foucault M. *Power/Knowledge: Selected Interviews and Other Writings, 1972-1977*.
548 *Translated by Colin Gordon, Leo Marshall, John Mepham, and Kate Soper.*, ed. C. Gordon
549 New York: Pantheon (1980).
- 550 30. Foucault M. *The Birth of Biopolitics: Lectures at the Collège de France, 1978--1979*.
551 *Translated by Graham Burchell.*, ed. M. Senellart London: Palgrave Macmillan (2010).
- 552 31. Lemke T. *Biopolitics: An advanced introduction*. *Translated by Eric Frederick Trump*. New
553 York: New York University Press (2011).
- 554 32. Mackenzie R. “Bestia Sacer and Agamben’s Anthropological Machine: Biomedical/Legal
555 Taxonomies as Somatechnologies of Human and Nonhuman Animals’ Ethico-Political
556 Relations,” in *Law and Anthropology* (Oxford University Press).
557 doi:10.1093/acprof:oso/9780199580910.003.0019
- 558 33. Wolfe C. *Before the law: humans and other animals in a biopolitical frame*. Chicago: The
559 University of Chicago Press (2013).
- 560 34. Foucault M. *Discipline and punish: The birth of the prison*. *Translated by Alan Sheridan*. New
561 York: Vintage (1995).
- 562 35. Foucault M. *The Archaeology of Knowledge*. *Translated by Alan Sheridan*. New York:
563 Pantheon (1972).
- 564 36. Pugliese J. “Terminal Truths: Foucault’s Animals and the Mask of the Beast,” in *Foucault and*
565 *Animals*, eds. M. Chrulaw, D. J. Wadiwel (Leiden: Brill), 17–36.
- 566 37. Derrida J. *The Animal That Therefore I Am*. *Translated by David Wills.*, ed. M.-L. Mallet
567 New York: Fordham University Press (2008).
- 568 38. Foucault M. *Madness and Civilization: A History of Insanity in the Age of Reason*. *Translated*
569 *by Richard Howard*. New York: Vintage (1973).
- 570 39. Chen MY. *Animacies: Biopolitics, racial mattering, and queer affect*. Durham and London:
571 Duke University Press (2012).
- 572 40. Adams CJ, Gruen L. *Ecofeminism: Feminist intersections with other animals and the earth*.
573 New York: Bloomsbury (2014).
- 574 41. Wallace RG, Bergmann L, Kock R, Gilbert M, Hogerwerf L, Wallace R, Holmberg M. The
575 dawn of Structural One Health: A new science tracking disease emergence along circuits of
576 capital. *Soc Sci Med* (2015) **129**:68–77. doi:10.1016/J.SOCSCIMED.2014.09.047
- 577 42. Shereen MA, Khan S, Kazmi A, Bashir N, Siddique R. COVID-19 infection: Origin,
578 transmission, and characteristics of human coronaviruses. *J Adv Res* (2020) **24**:91–98.
579 doi:10.1016/j.jare.2020.03.005
- 580 43. Wolfe ND, Dunavan CP, Diamond J. Origins of major human infectious diseases. *Nature*
581 (2007) **447**:279–283. doi:10.1038/nature05775

- 582 44. Nii-Trebi NI. Emerging and Neglected Infectious Diseases: Insights, Advances, and
583 Challenges. *Biomed Res Int* (2017) **2017**:5245021. doi:10.1155/2017/5245021
- 584 45. WHO. Neglected tropical diseases. (2019) Available at:
585 https://www.who.int/neglected_diseases/diseases/en/ [Accessed June 22, 2019]
- 586 46. WHO. WHO—World Health Assembly adopts resolution on neglected tropical diseases.
587 (2013).
- 588 47. Krenak A. *Ideias para adiar o fim do mundo*. Sao Paulo: Companhia das Letras (2019).
- 589 48. Latour B. *We have never been modern*. Trans. C. Porter. Hemel Hempstead, Harvester
590 Wheatsheaf. Cambridge: Harvard University Press (2012).
- 591 49. Baquero OS, Queiroz MR. Size, spatial and household distribution, and rabies vaccination
592 coverage of the Brazilian owned-dog population. *Transbound Emerg Dis* (2019)tbed.13204.
593 doi:10.1111/tbed.13204
- 594 50. IBGE. Pesquisa Nacional por Amostra de Domicílios - Síntese de indicadores. (2013).
- 595 51. Ascione FR. Children Who are Cruel to Animals: A Review of Research and Implications for
596 Developmental Psychopathology. *Anthrozoos A Multidiscip J Interact People Anim* (1993)
597 **6**:226–247. doi:10.2752/089279393787002105
- 598 52. Ascione FR, Weber C V, Thompson TM, Heath J, Maruyama M, Hayashi K. Battered Pets
599 and Domestic Violence Animal Abuse Reported by Women Experiencing Intimate Violence
600 and by Nonabused Women. *Violence Against Women* (2007) **13**:354–373.
601 doi:10.1177/1077801207299201
- 602 53. Baldry AC. Animal Abuse and Exposure to Interparental Violence in Italian Youth. (2003)
603 **18**:258–281. doi:10.1177/0886260502250081
- 604 54. Flynn CP. Examining the links between animal abuse and human violence. *Crime, Law Soc*
605 *Chang* (2011) **55**:453–468. doi:10.1007/s10611-011-9297-2
- 606 55. Gullone E. *Animal Cruelty, Antisocial Behaviour and Aggression More than a Link*.
607 Hampshire: Palgrave Macmillan (2012).
- 608 56. Allen M, Gallagher B, Jones B. Domestic violence and the abuse of pets: Researching the link
609 and its implications in Ireland. *Practice* (2006) **18**:167–181. doi:10.1080/09503150600904060
- 610 57. Faver CA, Strand EB. To Leave or to Stay? *J Interpers Violence* (2003) **18**:1367–1377.
611 doi:10.1177/0886260503258028
- 612 58. Faver CA, Strand EB. Fear, Guilt, and Grief: Harm to Pets and the Emotional Abuse of
613 Women. *J Emot Abus* (2007) **7**:51–70. doi:10.1300/J135v07n01_04
- 614 59. Newberry M. Pets in danger: Exploring the link between domestic violence and animal abuse.
615 *Aggress Violent Behav* (2017) **34**:273–281. doi:10.1016/J.AVB.2016.11.007

- 616 60. Upadhy V. Abuse of animals as a method of domestic violence: The need for criminalization.
617 *Emory Law J* (2013) **23**:
- 618 61. Baquero OS, Ferreira F, Robis M, Neto JSF, Onell JA. Bayesian spatial models of the
619 association between interpersonal violence, animal abuse and social vulnerability in São Paulo,
620 Brazil. *Prev Vet Med* (2018) **152**:48–55. doi:10.1016/J.PREVETMED.2018.01.008
- 621 62. Bourgois P. In search of masculinity: violence, respect and sexuality among Puerto Rican
622 crack dealers in east Harlem. *Br J Criminol* (1996) **36**:412–427.
623 doi:10.1093/oxfordjournals.bjc.a014103
- 624 63. Burke JG, O’Campo P, Peak GL. Neighborhood Influences and Intimate Partner Violence:
625 Does Geographic Setting Matter? *J Urban Heal* (2006) **83**:182–194. doi:10.1007/s11524-006-
626 9031-z
- 627 64. Cunradi CB, Caetano R, Clark C, Schafer J. Neighborhood Poverty as a Predictor of Intimate
628 Partner Violence Among White, Black, and Hispanic Couples in the United States: A
629 Multilevel Analysis. *Ann Epidemiol* (2000) **10**:297–308. doi:10.1016/S1047-2797(00)00052-1
- 630 65. Evans GW, English K. The Environment of Poverty: Multiple Stressor Exposure,
631 Psychophysiological Stress, and Socioemotional Adjustment. *Child Dev* (2002) **73**:1238–
632 1248. doi:10.1111/1467-8624.00469
- 633 66. Faver CA. School-based humane education as a strategy to prevent violence: Review and
634 recommendations. *Child Youth Serv Rev* (2010) **32**:365–370.
635 doi:10.1016/J.CHILDYOUTH.2009.10.006
- 636 67. Sprinkle JE. Animals, Empathy, and Violence. *Youth Violence Juv Justice* (2008) **6**:47–58.
637 doi:10.1177/1541204007305525
- 638 68. IBGE. Censo demográfico 2010 - Aglomerados subnormais. Rio de Janeiro (2011).
- 639 69. UN-Habitat. World cities report 2016. (2016).
- 640 70. Ezeh A, Oyebode O, Satterthwaite D, Chen Y-F, Ndugwa R, Sartori J, Mberu B, Melendez-
641 Torres GJ, Haregu T, Watson SI, et al. The health of people who live in slums 1 The history,
642 geography, and sociology of slums and the health problems of people who live in slums.
643 *www.thelancet.com* (2017) **389**: doi:10.1016/S0140-6736(16)31650-6
- 644 71. Schmidt PL. Companion Animals as Sentinels for Public Health. *Vet Clin North Am Small
645 Anim Pract* (2009) **39**:241–250. doi:10.1016/J.CVSM.2008.10.010
- 646 72. Pastorinho R, Sousa AC. *Pets as Sentinels, Forecasters and Promoters of Human Health*.
647 Cham: Springer (2020).
- 648 73. Labrecque J, Walsh CA. Homeless women’s voices on incorporating companion animals into
649 shelter services. *Anthrozoos* (2011) **24**:79–95. doi:10.2752/175303711X12923300467447

- 650 74. Taylor H, Williams P, Gray D. Homelessness and dog ownership: An investigation into
651 animal empathy, attachment, crime, drug use, health and public opinion. *Anthrozoos* (2004)
652 **17**:353–368. doi:10.2752/089279304785643230
- 653 75. Irvine L. *My Dog Always Eats First: Homeless People and Their Animals*. Boulder: Lynne
654 Rienner (2015).
- 655 76. Singer RS, Hart LA, Zasloff RL. Dilemmas associated with rehousing homeless people who
656 have companion animals. *Psychol Rep* (1995) **77**:851–857. doi:10.2466/pr0.1995.77.3.851
- 657 77. Sakelaropoulos K, Davey B, Knight M. Pets and homeless people in Nottingham. *People Anim*
658 *Together Heal* (1998)
- 659 78. Hinchliffe S, Whatmore S. Living cities: Towards a politics of conviviality. *Sci Cult (Lond)*
660 (2006) **15**:123–138. doi:10.1080/09505430600707988
- 661 79. Rotherham I. *Recombinant Ecology - A Hybrid Future?*. Sheffield (2017).
- 662 80. United Nations Development Programme. Goal 2: Zero hunger. *Sustain Dev Goals* Available
663 at: [https://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-2-zero-](https://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-2-zero-hunger.html)
664 [hunger.html](https://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-2-zero-hunger.html) [Accessed May 5, 2020]
- 665 81. IPCC. *Summary for policymakers. In: Climate Change 2014: Impacts, Adaptation, and*
666 *Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the*
667 *Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge:
668 Cambridge University Press (2014).
- 669 82. IPCC. *Technical Summary. In: Climate Change 2013: The Physical Science Basis.*
670 *Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental*
671 *Panel on Climate Change*. Cambridge: Cambridge University Press (2013).
- 672 83. Reisinger A, Clark H. How much do direct livestock emissions actually contribute to global
673 warming? *Glob Chang Biol* (2018) **24**:1749–1761. doi:10.1111/gcb.13975
- 674 84. Bento CB, Filoso S, Pitombo LM, Cantarella H, Rossetto R, Martinelli LA, do Carmo JB.
675 Impacts of sugarcane agriculture expansion over low-intensity cattle ranch pasture in Brazil on
676 greenhouse gases. *J Environ Manage* (2018) **206**:980–988.
677 doi:10.1016/j.jenvman.2017.11.085
- 678 85. McMahon BJ, Morand S, Gray JS. Ecosystem change and zoonoses in the Anthropocene.
679 *Zoonoses Public Health* (2018) **65**:755–765. doi:10.1111/zph.12489
- 680 86. World Bank Group. Rethinking the Path to Inclusion, Growth and Sustainability. Brazil
681 Systematic Country Diagnostic. (2016). Available at:
682 [http://documents.worldbank.org/curated/pt/239741467991959045/pdf/106569-SCD-P151691-](http://documents.worldbank.org/curated/pt/239741467991959045/pdf/106569-SCD-P151691-PUBLIC-non-board-version.pdf)
683 [PUBLIC-non-board-version.pdf](http://documents.worldbank.org/curated/pt/239741467991959045/pdf/106569-SCD-P151691-PUBLIC-non-board-version.pdf)

- 684 87. Cassidy ES, West PC, Gerber JS, Foley JA. Redefining agricultural yields: from tonnes to
685 people nourished per hectare. *Environ Res Lett* (2013) **8**:1–8.
- 686 88. Ministério do Desenvolvimento Regional do Brasil. SNIS - PAINEL DE INFORMAÇÕES
687 SOBRE SANEAMENTO. Available at: [http://www.snis.gov.br/painel-informacoes-](http://www.snis.gov.br/painel-informacoes-saneamento-brasil/web/painel-setor-saneamento)
688 [saneamento-brasil/web/painel-setor-saneamento](http://www.snis.gov.br/painel-informacoes-saneamento-brasil/web/painel-setor-saneamento) [Accessed May 5, 2020]
- 689 89. Alavanja MCR, Samanic C, Dosemeci M, Lubin J, Tarone R, Lynch CF, Knott C, Thomas K,
690 Hoppin JA, Barker J, et al. Use of Agricultural Pesticides and Prostate Cancer Risk in the
691 Agricultural Health Study Cohort. *Am J Epidemiol* (2003) **157**:800–814.
692 doi:10.1093/aje/kwg040
- 693 90. Pereira R, Simmons C, Walker R. Smallholders, Agrarian Reform, and Globalization in the
694 Brazilian Amazon: Cattle versus the Environment. *Land* (2016) **5**:24.
695 doi:10.3390/land5030024
- 696 91. Neo H, Emel J. *Geographies of Meat: Politics, Economy and Culture*. Abingdon: Routledge
697 (2017).
- 698 92. Martin P, Jackson-Smith D. *Immigration and Farm Labor in the U.S.* (2013).
- 699 93. Ramos A, Carlo G, Grant K, Trinidad N, Correa A. Stress, Depression, and Occupational
700 Injury among Migrant Farmworkers in Nebraska. *Safety* (2016) **2**:23.
701 doi:10.3390/safety2040023
- 702 94. Koutros S, Silverman DT, Alavanja MC, Andreotti G, Lerro CC, Heltshe S, Lynch CF,
703 Sandler DP, Blair A, Beane Freeman LE. Environmental Exposures and Cancer Occupational
704 exposure to pesticides and bladder cancer risk. *Int J Epidemiol* (2016) **45**:792–805.
705 doi:10.1093/ije/dyv195
- 706 95. Abdi H, Lee J, Ellison G, Lai G, Lam T. Abstract 2300: Pesticides and primary liver cancer: A
707 systematic review and meta-analysis. in *Cancer Research* (American Association for Cancer
708 Research (AACR)), 2300–2300. doi:10.1158/1538-7445.am2017-2300
- 709 96. Von Essen SG, Auvermann BW. Health effects from breathing air near CAFOs for feeder
710 cattle or hogs. *J Agromedicine* (2005) **10**:55–64. doi:10.1300/J096v10n04_08
- 711 97. Heederik D, Sigsgaard T, Thorne PS, Kline JN, Avery R, Bønløkke JH, Chrischilles EA,
712 Dosman JA, Duchaine C, Kirkhorn SR, et al. Health Effects of Airborne Exposures from
713 Concentrated Animal Feeding Operations. *Environ Health Perspect* (2007) **115**:298–302.
714 doi:10.1289/ehp.8835
- 715 98. Schultz AA, Peppard P, Gangnon RE, Malecki KMC. Residential proximity to concentrated
716 animal feeding operations and allergic and respiratory disease. *Environ Int* (2019) **130**:104911.
717 doi:10.1016/j.envint.2019.104911

- 718 99. Quandt SA, Arcury-Quandt AE, Lawlor EJ, Carrillo L, Marín AJ, Grzywacz JG, Arcury TA.
719 3-D jobs and health disparities: The health implications of latino chicken catchers' working
720 conditions. *Am J Ind Med* (2013) **56**:206–215. doi:10.1002/ajim.22072
- 721 100. Silbergeld EK, Graham J, Price LB. Industrial Food Animal Production, Antimicrobial
722 Resistance, and Human Health. *Annu Rev Public Health* (2008) **29**:151–169.
723 doi:10.1146/annurev.publhealth.29.020907.090904
- 724 101. Cho SH, Lim YS, Kang YH. Comparison of Antimicrobial Resistance in Escherichia coli
725 Strains Isolated From Healthy Poultry and Swine Farm Workers Using Antibiotics in Korea.
726 *Osong Public Heal Res Perspect* (2012) **3**:151–155. doi:10.1016/j.phrp.2012.07.002
- 727 102. Huang E, Gurzau AE, Hanson BM, Kates AE, Smith TC, Pettigrew MM, Spinu M,
728 Rabinowitz PM. Detection of livestock-associated methicillin-resistant Staphylococcus aureus
729 among swine workers in Romania. *J Infect Public Health* (2014) **7**:323–332.
730 doi:10.1016/j.jiph.2014.03.008
- 731 103. Rinsky JL, Nadimpalli M, Wing S, Hall D, Baron D, Price LB, Larsen J, Stegger M, Stewart J,
732 Heaney CD. Livestock-Associated Methicillin and Multidrug Resistant Staphylococcus aureus
733 Is Present among Industrial, Not Antibiotic-Free Livestock Operation Workers in North
734 Carolina. *PLoS One* (2013) **8**: doi:10.1371/journal.pone.0067641
- 735 104. Fitzgerald AJ, Kalof L, Dietz T. Slaughterhouses and Increased Crime Rates. *Organ Environ*
736 (2009) **22**:158–184. doi:10.1177/1086026609338164
- 737 105. Singer P. *Animal Liberation: The Definite Classic of Animal Movement*. New York: Harper
738 Perennial Modern Classics (2009).
- 739 106. Robbins JA, Franks B, Weary DM, Von Keyserlingk MAG. Awareness of ag-gag laws erodes
740 trust in farmers and increases support for animal welfare regulations. *Food Policy* (2016)
741 **61**:121–125. doi:10.1016/j.foodpol.2016.02.008
- 742 107. ASPCA. What Is Ag-Gag Legislation? *Farm Anim Welf* Available at:
743 <https://www.asPCA.org/animal-protection/public-policy/what-ag-gag-legislation> [Accessed
744 May 5, 2020]
- 745 108. da Rocha PR, Leal David HMS. Determination or determinants? A debate based on the theory
746 on the social production of health. *Rev da Esc Enferm* (2015) **49**:129–135. doi:10.1590/S0080-
747 623420150000100017
- 748 109. Garbois JA, Sodré F, Dalbello-Araujo M. Da noção de determinação social à de determinantes
749 sociais da saúde. *Saúde em Debate* (2017) **41**:63–76. doi:10.1590/0103-1104201711206
- 750 110. Rock MJ, Degeling C. “Toward ‘one health’ promotion,” in *A Companion to the Anthropology*
751 *of Environmental Health*, ed. M. Singer (Chichester: Wiley-Blackwell), 68–82.
- 752 111. Keck F. A Genealogy of Animal Diseases and Social Anthropology (1870–2000). *Med*
753 *Anthropol Q* (2019) **33**:24–41. doi:10.1111/maq.12442

- 754 112. Peggs K. *Animals and Sociology*. London: Palgrave Macmillan (2012).
- 755 113. Tuomivaara S. *Animals in the Sociologies of Westermarck and Durkheim*. London: Palgrave
756 Macmillan (2019).
- 757 114. Breilh J. *Epidemiologia crítica: ciência emancipadora e intercultural*. Translated by Vera
758 Ribeiro. Rio de Janeiro: Editora Fiocruz (2006).
- 759 115. Samaja J. *Epistemología de la salud: reproducción social, subjetividad y transdisciplina*.
760 Buenos Aires: Lugar (2007).
- 761 116. Foucault M. *Microfísica do Poder. Organização, introdução e revisão técnica de Renato*
762 *Machado*. 26th ed. Sao Paulo: Graal (2013).
- 763 117. Bourdieu P. *Intelectuales, política y poder*. Translation by Alicia Gutierrez. Buenos Aires:
764 Eudeba (2002).
- 765 118. Bourdieu P. *Habitus and Field: General Sociology, Volume 2 (1982-1983)*. Translation by
766 Peter Collier. Cambridge: Polity (2019).
- 767 119. Freire P. *Pedagogy of the oppressed*. Translated by Myra Bergman Ramos. New York:
768 Bloomsbury (2014).
- 769 120. Campos GW de S. Saúde pública e saúde coletiva: campo e núcleo de saberes e práticas. *Cien*
770 *Saude Colet* (2000) 5:219–230. doi:10.1590/s1413-81232000000200002
- 771 121. Birman J. A physis da saúde coletiva. *Physis Rev Saúde Coletiva* (1991) 1:7–11.
772 doi:10.1590/s0103-73311991000100001
- 773 122. Almeida Filho N de. Transdisciplinaridade e Saúde Coletiva. *Cien Saude Colet* (1997) 2:5–20.
774 doi:10.1590/1413-812319972101702014
- 775 123. de Souza LEPEF. Saúde Pública ou Saúde Coletiva? *Rev Espaço para a saúde* (2014) 15:7–21.
- 776 124. Davis MF, Rankin SC, Schurer JM, Cole S, Conti L, Rabinowitz P, Gray G, Kahn L,
777 Machalaba C, Mazet J, et al. Checklist for One Health Epidemiological Reporting of Evidence
778 (COHERE). *One Heal* (2017) 4:14–21. doi:10.1016/J.ONEHLT.2017.07.001