

Anna-Sofie Stensgaard

Parasitology and Aquatic Pathobiology

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Research Profile

My research focus on understanding and predicting the broad-scale geographical variation and changing pat-terns of vector-borne and parasitic diseases, with special emphasis on tick, mosquito and snail-borne diseases using a One Health approach. I use a mix of theory and tools from ecology, epidemiology and global change biology. I am particularly interested in disentangling the role of climate change for zoonotic and vector-borne parasitic diseases, relative to other known environmental, ecological and social drivers.

Research outputs

Både læge- og dyrlægestudiet bør undervise i klimaforandringer og sundhed

Stensgaard, Anna-Sofie, Thamsborg, Stig Milan & Vennervald, Birgitte J, 2023, In: Ugeskrift for Læger. 185, 6, p. 554-555 2 p.

Climate-driven 'species-on-the-move' provide tangible anchors to engage the public on climate change

Pecl, G. T., Kelly, R., Lucas, C., van Putten, I., Badhe, R., Champion, C., Chen, I-C., Defeo, O., Gaitan-Espitia, J. D., Evengård, B., Fordham, D. A., Guo, F., Henriques, R., Henry, S., Lenoir, J., McGhie, H., Mustonen, T., Oliver, S., Pettorelli, N., Pinsky, M. L. & 6 others, Potts, W., Santana-Garcon, J., Sauer, W., Stensgaard, Anna-Sofie, Tingley, M. W. & Verges, A., 2023, In: People and Nature . 5, 5, p. 1384-1402 19 p.

Update on the Geographic Distribution of the Intermediate Host Snails of *Schistosoma mansoni* on St. Lucia: A Step Toward Confirming the Interruption of Transmission of Human Schistosomiasis

Mukaratirwa, S., Laidemitt, M. R., Hewitt, R., Sengupta, Mita Eva, Marchi, S., Polius, C., Belmar, S., Scholte, R. G. C., Perez, F., Stensgaard, Anna-Sofie, Vennervald, Birgitte J, Willingham, A. L. & Loker, E. S., 2023, In: The American journal of tropical medicine and hygiene. 109, 4, p. 811-819

Environmental DNA in human and veterinary parasitology - Current applications and future prospects for monitoring and control

Sengupta, Mita Eva, Lynggaard, Christina Islas, Mukaratirwa, S., Vennervald, Birgitte J & Stensgaard, Anna-Sofie, 2022, In: Food and Waterborne Parasitology. 29, 17 p., e00183.

Potential Hybridization of *Fasciola hepatica* and *F. gigantica* in Africa — A Scoping Review

Nukeri, S., Malatji, M. P., Sengupta, Mita Eva, Vennervald, Birgitte J, Stensgaard, Anna-Sofie, Chaisi, M. & Mukaratirwa, S., 2022, In: Pathogens. 11, 11, 25 p., 1303.

Sero-prevalence and risk factors of *Toxoplasma gondii* infection in wild cervids in Denmark

Stensgaard, Anna-Sofie, Sengupta, Mita Eva, Chriel, M., Nielsen, S. T. & Petersen, H. H., 2022, In: International Journal for Parasitology: Parasites and Wildlife. 17, p. 288-294 7 p.

Prevalence of *Toxoplasma gondii* and *Cryptosporidium* in Feral and Farmed American Mink (*Neovison vison*) in Denmark

Sengupta, Mita Eva, Pagh, S., Stensgaard, Anna-Sofie, Chriel, M. & Petersen, H. H., 2021, In: Acta Parasitologica. 66, p. 1285-1291

The conservation status of the world's freshwater molluscs

Böhm, M., Dewhurst-Richman, N. I., Seddon, M., Ledger, S. E. H., Albrecht, C., Allen, D., Bogan, A. E., Cordeiro, J., Cummings, K. S., Cuttelod, A., Darrigran, G., Darwall, W., Fehér, Z., Gibson, C., Graf, D. L., Köhler, F., Lopes-Lima, M., Pastorino, G., Perez, K. E., Smith, K. & 31 others, van Damme, D., Vinarski, M. V., von Proschwitz, T., von Rintelen, T., Aldridge, D. C., Aravind, N. A., Budha, P. B., Clavijo, C., Van Tu, D., Gargominy, O., Ghamizi, M., Haase, M., Hilton-Taylor, C., Johnson, P. D., Kebapçı, Ü., Lajtner, J., Lange, C. N., Lepitzki, D. A. W., Martínez-Ortí, A., Moorkens, E. A., Neubert, E., Pollock, C. M., Prié, V., Radea, C., Ramirez, R., Ramos, M. A., Santos, S. B., Slapnik, R., Son, M. O.,

Stensgaard, Anna-Sofie & Collen, B., 2021, In: *Hydrobiologia*. 848, 12/13, p. 3231-3254

Covid-19: End of the beginning?

Bergquist, R. & Stensgaard, Anna-Sofie, 2020, In: *Geospatial Health*. 15, 1, p. 1-10 10 p., 897.

Schistosomiasis and climate change

De Leo, G. A., Stensgaard, Anna-Sofie, Sokolow, S. H., N'Goran, E. K., Chamberlin, A. J., Yang, G. J., Utzinger, J. & De Leo, G. A., 2020, In: *The BMJ*. 371, 8 p., m4324.

Bayesian conditional autoregressive models to assess spatial patterns of diarrhoea risk among children under the age of 5 years in Mbour, Senegal

Thiam, S., Cisse, G., Stensgaard, Anna-Sofie, Niang-Diene, A., Utzinger, J. & Vounatsou, P., 2019, In: *Geospatial Health*. 14, 2, p. 321-328

Environmental DNA for improved detection and environmental surveillance of schistosomiasis

Sengupta, Mita Eva, Hellstrom, M., Kariuki, H. C., Olsen, A., Thomsen, P. F., Mejer, Helena, Willerslev, Eske, Mwanje, M. T., Madsen, Henry, Kristensen, T. K., Stensgaard, Anna-Sofie & Vennervald, Birgitte J., 2019, In: *Proceedings of the National Academy of Sciences of the United States of America*. 116, 18, p. 8931-8940

Schistosomes, snails and climate change: Current trends and future expectations

Stensgaard, Anna-Sofie, Vounatsou, P., Sengupta, Mita Eva & Utzinger, J., 2019, In: *Acta Tropica*. 190, p. 257-268

The future is now: New United Nations' Sustainable Development Goals report provides a perspective on vector-borne diseases

Stensgaard, Anna-Sofie, Rinaldi, L. & Bergquist, R., 2019, In: *Geospatial Health*. 14, 2, p. 179-181

Towards improved, cost-effective surveillance of Ixodes ricinus ticks and associated pathogens using species distribution modelling

Signorini, M., Stensgaard, Anna-Sofie, Drigo, M., Simonato, G., Mercer, F., Montarsi, F., Martini, M. & Cassini, R., 2019, In: *Geospatial Health*. 14, 1, p. 46-52 745 .

Patterns of *Fasciola hepatica* infection in Danish dairy cattle: implications for on-farm control of the parasite based on different diagnostic methods

Takeuchi-Storm, N., Denwood, Matt, Petersen, H. H., Enemark, H. L., Stensgaard, Anna-Sofie, Sengupta, Mita Eva, Beesley, N. J., Hodgkinson, J., Williams, D. & Thamsborg, Stig Milan, 2018, In: *Parasites & Vectors*. 11, 18 p., 674.

Vector-borne diseases in a warmer world: Will they stay or will they go?

Bergquist, R., Stensgaard, Anna-Sofie & Rinaldi, L., 2018, In: *Geospatial Health*. 13, 1, 2 p., 699.

Climate change and schistosomiasis: a global synthesis of research findings, knowledge gaps and new research directions

Stensgaard, Anna-Sofie, Vounatsou, P. & Utzinger, J., 2017, p. 304. 1 p.

Comparison of the spatial patterns of schistosomiasis in Zimbabwe at two points in time, spaced twenty-nine years apart: is climate variability of importance?

Pedersen, U. B., Karagiannis-Voules, D., Midzi, N., Mduluzi, T., Mukaratirwa, S., Fensholt, Rasmus, Vennervald, Birgitte J, Kristensen, T. K., Vounatsou, P. & Stensgaard, Anna-Sofie, 2017, In: *Geospatial Health*. 12, 1, p. 59-66 8 p., 505.

The neglected geography of human pathogens and diseases

Stensgaard, Anna-Sofie, Dunn, Rob, Vennervald, Birgitte J & Rahbek, Carsten, 2017, In: *Nature Ecology & Evolution*. 1, 7 , 2 p., 0190.

Associations between patterns of human intestinal schistosomiasis and snail and mammal species richness in Uganda: can we detect a decoy effect?

Stensgaard, Anna-Sofie, Kristensen, T. K., Jørgensen, Aslak, B. Kabatereine, N. & Rahbek, Carsten, 2016, In: *Frontiers of Biogeography*. 8, 3, 10 p., e21748.

Combining process-based and correlative models improves predictions of climate change effects on *Schistosoma mansoni* transmission in eastern Africa

Stensgaard, Anna-Sofie, Booth, M., Nikulin, G. & McCreesh, N., 2016, In: Geospatial Health. 11, 1s, p. 94-101 8 p.

Ecological drivers of *Mansonella perstans* infection in Uganda and patterns of coendemicity with lymphatic filariasis and malaria

Stensgaard, Anna-Sofie, Vounatsou, P., Onapa, A. W., Utzinger, J., Pedersen, E. M., Kristensen, T. K. & Simonsen, P. E., 2016, In: PLoS Neglected Tropical Diseases . 10, 1, 16 p., e0004319.

Combining a process-based and correlative approach to predict the impacts of climate change on schistosomiasis in eastern Africa

Stensgaard, Anna-Sofie, Booth, M., Nikulin, G. & McCreesh, N., 2015, In: Tropical Medicine & International Health. 20, S1, p. 436 1 p., PS2.353.LB.

Ecological niche model of *Phlebotomus perniciosus*, the main vector of canine leishmaniasis in north-eastern Italy

Signorini, M., Cassini, R., Drigo, M., di Regalbono, A. F., Pietrobelli, M., Montarsi, F. & Stensgaard, Anna-Sofie, 2014, In: Geospatial Health. 9, 1, p. 193-201 9 p.

Lymphatic filariasis control in Tanga Region, Tanzania: status after eight rounds of mass drug administration

Simonsen, P. E., Derua, Y. A., Magesa, S. M., Pedersen, E. M., Stensgaard, Anna-Sofie, Malecela, M. N. & Kisinza, W. N., 2014, In: Parasites & Vectors. 7, 19 p., 507.

Mapping the geographical distribution of lymphatic filariasis in Zambia

Mwase, E. T., Stensgaard, Anna-Sofie, Nsakashalo-Senkwe, M., Mubila, L., Mwansa, J., Songolo, P., Shawa, S. T. & Simonsen, P. E., 2014, In: PLoS Neglected Tropical Diseases. 8, 2, 13 p., e2714.

Modelling climate change impact on the spatial distribution of fresh water snails hosting trematodes in Zimbabwe

Pedersen, U. B., Stendel, M., Midzi, N., Mduluzi, T., Soko, W., Stensgaard, Anna-Sofie, Vennervald, Birgitte J, Mukaratirwa, S. & Kristensen, T. K., 2014, In: Parasites & Vectors. 7, 12 p., 536.

Modelling spatial distribution of snails transmitting parasitic worms with importance to human and animal health and analysis of distributional changes in relation to climate

Pedersen, U. B., Midzi, N., Mduluzi, T., Soko, W., Stensgaard, Anna-Sofie, Vennervald, Birgitte J, Mukaratirwa, S. & Kristensen, T. K., 2014, In: Geospatial Health. 8, 2, p. 335-343 9 p.

Emerging risk for leishmaniasis in north-eastern Italy: preliminary results of a 12-years entomological survey

Signorini, M., Pietrobelli, M., Stensgaard, Anna-Sofie, Babiker, A., Marcer, F., Montarsi, F. & Cassini, R., Sep 2013, In: Tropical Medicine & International Health. 18, Supplement s1, p. 136-136 1 p., P.1.4.9.018 (B).

Exploring patterns and distributions of parasite intermediate host snails in Africa using climate-based species distribution modelling

Stensgaard, Anna-Sofie & Kristensen, T. K., Sep 2013, In: Tropical Medicine & International Health. 18, s1, p. 104-105 2 p., O.6.8.1.001.

Large-scale determinants of intestinal schistosomiasis and intermediate host snail distribution across Africa: does climate matter?

Stensgaard, Anna-Sofie, Utzinger, J., Vounatsou, P., Hürlimann, E., Schur, N., Saarnak, C., Simoonga, C., Mubita, P., Kabatereine, N. B., Tchuente, L. T., Rahbek, Carsten & Kristensen, T. K., 2013, In: Acta Tropica. 128, 2, p. 378-390 13 p.

Spatially explicit *Schistosoma* infection risk in eastern Africa using Bayesian geostatistical modelling

Schur, N., Hürlimann, E., Stensgaard, Anna-Sofie, Chimfwembe, K., Mushingi, G., Simoonga, C., Kabatereine, N. B., Kristensen, T. K., Utzinger, J. & Vounatsou, P., 2013, In: Acta Tropica. 128, 2, p. 365-377 13 p.

Virtual globes and geospatial health

Saarnak, C., Stensgaard, Anna-Sofie, Bergquist, R., Zhou, X. & Utzinger, J., 2013, *Geographic health data: fundamental techniques for analysis*. Boscoe, F. P. (ed.). Wallingford: CABI International, p. 31-50 20 p.

Bayesian geostatistical modelling of malaria and lymphatic filariasis infections in Uganda: predictors of risk and geographical patterns of co-endemicity

Stensgaard, Anna-Sofie, Vounatsou, P., Onapa, A. W., Simonsen, P. E., Pedersen, E. M., Rahbek, Carsten & Kristensen, T. K., 2011, In: *Malaria Journal*. 10, 298, 14 p.

The ecology of infectious diseases: Patterns, determinants and distributions of parasitic infections in Africa

Stensgaard, Anna-Sofie, 2011, University of Copenhagen.

Toward an open-access global database for mapping, control, and surveillance of neglected tropical diseases

Hürlimann, E., Schur, N., Boutsika, K., Stensgaard, Anna-Sofie, de Himpsl, M. L., Ziegelbauer, K., Laizer, N., Camenzind, L., Pasquale, A. D., Ekpo, U. F., Simoonga, C., Mushinge, G., Saarnak, C. F. L., Utzinger, J., Kristensen, T. K. & Vounatsou, P., 2011, In: *P L o S Neglected Tropical Diseases*. 5, 12, 11 p.

Modeling the distribution of four parasite intermediate host snails in Zimbabwe using three different environmental data sources/models: the influence of climate layer quality/accuracy

Kristensen, T. K., Stensgaard, Anna-Sofie, McCarroll, J. & Mukararirwa, S., 2010, *Congress handbook: the XIIIth international congress of parasitology: Australia, 2010*. Australian Society for Parasitology, 1 p.

Remote sensing, geographical information system and spatial analysis for schistosomiasis epidemiology and ecology in Africa

Simoonga, C., Utzinger, J., Brooker, S., Vounatsou, P., Appleton, C. C., Stensgaard, Anna-Sofie, Olsen, A. & Kristensen, T. K., 2009, In: *Parasitology*. 136, 13, p. 1683-1693 11 p.

The status and distribution of freshwater molluscs: chapter 4

Kristensen, T. K., Appleton, C. C., Curtis, B. & Stensgaard, Anna-Sofie, 2009, *The status and distribution of freshwater biodiversity in Southern Africa*. Darwall, W. R. T., Smith, K. G., Tweddle, D. & Skelton, P. (eds.). IUCN, p. 38-47 10 p.

The status and distribution of freshwater molluscs (Mollusca)

Kristensen, T. K., Stensgaard, Anna-Sofie, Seddon, M. B. & Mclvor, A., 2009, *The status and distribution of freshwater biodiversity in Western Africa*. Smith, K. G., Diop, M. D., Niane, M. & Darwall, W. R. T. (eds.). IUCN, p. 33- 40 8 p.

Virtual globes and geospatial health: the potential of new tools in the management and control of vector-borne diseases

Stensgaard, Anna-Sofie, Saarnak, C. F. L., Utzinger, J., Vounatsou, P., Simoonga, C., Mushinge, G., Rahbek, Carsten, Møhlenberg, F. & Kristensen, T. K., 2009, In: *Geospatial Health*. 3, 2, p. 127-141 15 p.

Virtual globes and geospatial health: the potential of new tools in the management and control of vector-borne diseases

Stensgaard, Anna-Sofie, Saarnak, C. F. L., Utzinger, J., Vounatsou, P., Simoonga, C., Mushinge, G., Rahbek, Carsten, Møhlenberg, F. & Kristensen, T., 2009, In: *Geospatial Health*. 3, 2, p. 127-141

Freshwater snail diversity, climate and snail borne diseases in Zimbabwe: a study utilizing GIS and remote sensing

Kristensen, T. K., Stensgaard, Anna-Sofie, Solander, K. & Mukararirwa, S., 2007. 1 p.

Modeling freshwater snail habitat suitability and areas of potential snail-borne disease transmission in Uganda

Stensgaard, Anna-Sofie, Jørgensen, Aslak, Kabatereine, N. B., Rahbek, Carsten & Kristensen, T. K., 2006, In: *Geospatial Health*. 1, 1, p. 93-104 12 p.

Modeling the distribution of *Schistosoma mansoni* and host snails in Uganda using satellite sensor data and Geographical Information Systems

Stensgaard, Anna-Sofie, Jørgensen, Aslak, Kabatereine, N. B., Malone, J. B. & Kristensen, T. K., Mar 2005, In: *Parassitologia*. 47, 1, p. 115-25 11 p.

Press/Media

Her skal du passe på: Parasitter angriber folkeskoleklasse

Anna-Sofie Stensgaard
01/07/2023
1 Media contribution

Klima- og naturforandringer kan give nye smitsomme sygdomme i Danmark

Anna-Sofie Stensgaard
01/08/2022
1 Media contribution

Ny rapport giver overblik: Sådan påvirker klimaforandringerne vores børns helbred i fremtiden

Anna-Sofie Stensgaard
14/11/2019
1 Media contribution

Stimulus workshop on Globalization, climate change and human health

Anna-Sofie Stensgaard
24/03/2023
1 Media contribution

Vildt Naturligt - Skal parasitter også være her?

Anna-Sofie Stensgaard
15/05/2023
1 Media contribution

Zoonosernes årti? Biodiversitetskrisen efter corona

Anna-Sofie Stensgaard
20/10/2020
1 Media contribution

Employment

- 01/2021- current: Associate Professor, Section for Parasitology and Aquatic Diseases, Department of Veterinary and Animals Science, UCPH
- 01/2020-12/2020 Senior researcher, Section for Parasitology and Aquatic Diseases, Department of Veterinary and Animals Science, UCPH
- 01/2017-12/2019 Assistant Professor/Head of the Research Platform for Disease Ecology, Climate and Health, Center for Macroecology, Evolution and Climate (CMEC), GLOBE Institute, UCPH.
- 07/2014-12/2016 Assistant Professor in Disease Ecology, CMEC, The Natural History Museum of Denmark, UCPH (periods: 07/2014-06/2015 + 09/2015-12/2016).
- 05/2011-06/2014 Postdoctoral researcher in “*Macroecology of Vector-borne disease*”, under the *Programme of Excellence*, Department of Biology, Faculty of Science, UCPH.
- 06/2005-05/2006 Research assistant, The Danish Bilharziasis Laboratory. Main tasks: Aquatic snail specimen collection curating and digitization, external consultancy for the IUCN Freshwater Biodiversity Assessment programme, Liason Officer, Danmarks Akvarium.

Research management and leadership

10/2021-08/2025: Coordinator (PI) PREPARE4VBD – A Cross-Disciplinary Alliance to Identify, PREDict and prePARE for Emerging Vector- Borne Diseases, 4yr EU Horizon 2020 funded RIA pro-ject, 11 partners (total budget 6 mill EUR).

09/2020-06/2024:PI Changing Patterns of Vectors and Vectorborne Diseases, 4 yr. research project funded by Knud Højgaards Fond) (total budget 2 mill DKK).

01/2020: WP leader, DANIDA/FFU funded project: Predicting vector-borne disease epidemics: Dis-semination of risk forecasting using DHIS2 in Tanzania (total budget: 12 mill. DKK).

01/2017-12/2019PI The Research Platform for Disease Ecology, Climate and Health (funded by Knud Højgaards Fond,

total budget: 2.4 mill. DKK).

01/2017-06/2020Co-PI The Dragon 4 project: Forecasting vector-borne diseases by Earth Observation Data Mining. Project ID32260

06/2016Challenge of Science Leadership course, Barefoot Thinking Company, Plymouth, UK

01/2016- Associate editor, The International Journal of the Society for Geospatial Health.

01/2015-Executive Committee member, The International Society for Geospatial Health, Gnosis-gis.org.

05/2015-06/2016PI, research-project "Mapping snail-borne liver-flukes of wild deer populations in Gribskov" in collaboration with Naturstyrelsen, Denmark.

09/2012-12/2015Head of The Mandahl Barth Research Centre for Biodiversity and Health, (established in 2006).

03/2006-10/2010Workpackage leader, EU-FP6 project "CONTRAST" A multi-disciplinary Alliance to Optimize Schistosomiasis Control and Transmission Surveillance in Sub-Saharan Africa, counting 14 partners in 11 countries (total budget: €2.9 million). Responsible for WP to establish GIS-database on demographic, environmental, malacological, parasitological and socio-economic data for sub-Saharan Africa (now the GNTD.org database).

2006-: Workshop/symposium organizer: CONTRAST workshops in Uganda (2006), Cameroon (2007), Kenya (2010). Annual International Symposia for the International Society for Geo-spatial Health, Italy (2008;2010; 2011; 2013; 2014-2022); ICOPA 2022: Symposium "One Health and Schistosomiasis in a Changing World" and "Geospatial tools and methods in parasitology and spatial epidemiology" (the latter highlighted in the Lancet, (Frias, 2022. Highlights from ICOPA 2022; The Lancet Vol. 3(11) E813))

External funding and grants

2021-2025PREPARE4VBD – A Cross-Disciplinary Alliance to Identify, PREDict and prePARE for Emerging Vector- Borne Diseases, 4 yr EU Horizon 2020 funded RIA project, with a Consortium of 10 research and ministerial institutions from 8 countries in Europe and Africa (total budget 6 mill EUR). Role: Coordinator

2020 -2024Changing patterns of Vectors and Vectorborne diseases, Knud Højgaard Fund, (2 mill. DKK). Role: PI

2020-2025DANIDA FFU: Predicting vector-borne disease epidemics: Dissemination of risk forecasting using District Health Information Software2 in Tanzania. (PI: Prof. Michael Alifrangis, Center for Medical Parasitology, UCPH) (12 mill. DKK). Role: Co-PI and WP leader,

2019-2021Tracking swimmers itch parasites with eDNA. Augustinus Fonden (400.000 DKK). Role: PI

2021-2023Evaluation of Environmental DNA Technology for Detecting Schistosoma mansoni in Low Transmission Areas of the Caribbean. Ross University School of Veterinary Medicine Intramural Grant. PI: Arve Lee Willingham, RUSVM, co-PI Samson Mukaratirwa, RUSVM. Role: co-applicant and senior key personnel.

2017-2020The Research Platform for Disease Ecology, Climate and Health, University of Copenhagen, funded by Knud Højgaard Fund, (2.4 mill. DKK). Role PI.

2019EUopSTART funding to prepare stage 1 application for EUhorizon2020 call "C.[2020]: Vector-borne diseases in Africa (RIA)" (75.000 DKK). Role: Co-applicant, wrote the application.

2016-2020The Dragon 4 project ID32260 (Co-PI) (gives free access to satellite data from ESA and NRSCC to forecast vector-borne tropical diseases by Earth Observation Data Mining).

2014-2015Carlsberg Research Infrastructure Grant for snail-parasite microcosm experiments, Role: co-PI, wrote the application.

2009 Co-funding for own PhD-project personally procured, DHI –Water and Environment (500.000 DKK).

2009 Fieldwork grant, the Danish Bilharziasis Laboratory, Copenhagen Denmark (55.000 DKK).

2004WWF Verdensnaturfonden/Novo Nordisk Biodiversitetslegatet (21.008 DKK).