



Interdisciplinary Centre on Population Dynamics (CPop)

Annual Report 2018

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1 Mission, Goals, Research and Teaching Initiatives

1.1 Mission and Goals

The purpose of SDU's Interdisciplinary Centre on Population Dynamics (CPop) is to advance interdisciplinary research that cuts across four SDU faculties and that furthers understanding of the demographic, social, economic, health, and cultural consequences of population change, especially population aging in human and non-human populations and their policy implications. These implications are highly relevant for ageing societies, including Denmark but also internationally, and for conservation of non-human endangered species. About three dozen of CPop core and affiliated researchers are building on their expertise spanning from mathematics, biology, epidemiology, demography, economics and humanities and conduct insightful, cross-disciplinary research.

Specifically, the **goals** of CPOP are:

1. To publish ground-breaking, interdisciplinary research in widely read journals with extensive press coverage, leading to widespread citations, international awards and prestigious external grants.
2. To create unique interdisciplinary educational activities that will develop the talent of our students and educate them about the causes and consequences of longer, healthier lives.
3. To create direct value for society by becoming a paradigm of how university programs can reach out to the public with applied and relevant research on, e.g., forecasting population dynamics, thereby shaping the future of our society.
4. To look beyond our borders and strengthen SDU's internationalization efforts.

CPop is a SDU's Centre of Excellence. It succeeds the former MaxO Center that was evaluated in 2017 as the world's top research program on the biological and biomedical demography of aging. Building on this foundation, CPop expands into a truly multidisciplinary initiative with substantive participation of four SDU faculties and a multi-faceted research agenda that address the societal and human consequences of the rapidly on-coming demographic changes.

After a transition period that saw its formal establishment, **CPop started to operate officially from September 2018.**

1.2 Research and Teaching Initiatives

In order to fulfill its goals, interdisciplinary **research initiatives** focusing on the causes and consequences of longer, healthier lives are developed by building on the following research areas in four of the Faculties of SDU (Health (SUND), Humanities (HUM), Social Sciences (SAM) and Natural Sciences (NAT)).

1. Further development of the highly successful MaxO research on the evolutionary demography of aging, with a focus on analyses of the distribution of lifespans for humans and across other species and with increased emphasis on conservation demography of endangered species. This research is led by researchers in NAT working with researchers in SUN and SAM and in close collaboration with the Max Planck Institute for Evolutionary Biology in Plön.

2. Research on the causes, consequences and dynamics of health, treatment, well-being and survival at ages above 90, with emphasis on centenarians. Continued progress in increasing life expectancy and improving health will increasingly depend on trends after age 90 and in the longer run after age 100. Hence it is crucial to study the health, treatment, well-being and survival of the rapidly growing numbers of those 90+. This can be done in Denmark better than in any other country because of the extensive and highly accurate data available. This research is led by researchers in SUN collaborating with researchers in NAT, SAM and HUM.

3. Research on the dynamics of health at ages 50-90 using data from SHARE and other sources, including cultural artifacts. This initiative can be led by researchers in SAM when the research unit is established. Some of this research would further develop productive current research on male-female differences in health and survival.

4. Applied research that both focuses on forecasting the dynamics of population aging in Denmark and the likely social and cultural consequences and policy implications and critically engages public discourse on these questions. MaxO has developed considerable strength in developing more powerful methods of forecasting life expectancy and other aspects of population change. We are expanding and developing this research to include applied research focused on Denmark—and with possible application to other countries as well.

An important goal of CPOP is to develop unique, innovative, **interdisciplinary educational activities** to educate students about the causes and consequences of longer, healthier lives and other topics related to population dynamics, including population forecasting and understanding of the consequences and policy implications of population change. This goal will be achieved through a number of different educational activities including:

1. New cross-disciplinary elements, courses and profiles that will be developed in existing programs of study for bachelor's and master's students who are interested in getting a broad perspective on the dynamics of population aging and the social, economic and health consequences and policy implications.

2. Continuation and further development of the current SDU talent program in aging (scheduled to start in 2019).

3. Continued contribution to ESD (the European Doctoral School of Demography).

CPOP aspires to create significant value for society through close and continued **interaction with relevant stakeholders** (including policy makers and policy analysts, leaders of non-governmental organizations, journalists and students) at many different levels and in many different forms to communicate findings and to receive feedback.

A diverse portfolio of **outreach activities** is planned some of which have started in 2018:

1. Applied research on forecasting population dynamics of longer, healthier lives that can be used to provide better information on trends and implications in Denmark and to develop models of forecasting and policy analysis that can be applied in other countries as well. The impact of population change is so great for Danish society—and for the Danish government, pension organizations, insurance firms, financial institutions, and businesses more specifically—that use of more powerful methods of forecasting would be highly beneficial. In 2018, CPop hosted a workshop on mortality forecasting for Denmark with leading Danish stakeholders (read more in Section 6.1).
2. Policy analyses of the social, economic and health consequences and policy implications of changing population dynamics in Denmark, e.g., the implications for age at retirement or for redistributing work. Once an Impact Unit of CPop is established, analyses and recommendations will be published in an annual report and presented at recurring event for policymakers, media and relevant stakeholders.
3. Events and workshops for policymakers, sponsors and other relevant stakeholders on specialized topics of interest. CPOP will take advantage of its membership in Population Europe (population-europe.eu), of which Vaupel (CPop Director) is Chair of the Board of Trustees, to reach out to a broader European audience.
4. Extensive media presence (see Section 5.2).

1.3 Organization and governance structure

CPop is an interdisciplinary interfaculty centre of excellence that consist of CPop Kernel and four faculty units CPop NAT, HUM, SUND, and SAM. As such it reports to the Vice Chancellor.

CPop Kernel, formally nested in SAM, fulfills the role of coordination and research interlinkage for the whole CPop. It includes the director, the deputy director, some of the former core researchers of MaxO and the administration of CPop. In 2019, the Impact Unit focusing on the outreach activities, applied research and research dissemination will be created within Kernel.

Governance structure includes CPop Director, Internal Scientific Committee and External Scientific Committee (Advisory Board). In 2018 the governance body included the following members:

<u>CPop Director:</u>	James Vaupel
<u>Internal Scientific Committee:</u>	James Vaupel
	Annette Baudisch (CPop Deputy Director)
	Rune Lindahl Jacobsen (Head of CPop SUND Unit)
	Peter Simonsen (Head of CPop HUM Unit)
	Donald Canfield (Head of CPop NAT Unit)
	Christian Møller Dahl (Head of CPop SAM Unit)

Internal Scientific Committee holds monthly executive meetings.

External Scientific Committee:

The External Scientific Committee will be responsible for the recurrent evaluations of CPOP and serve as advisory in the hiring process of the new CPop director and other key CPop personnel. Members to the Committee were nominated in December 2018 and approved by the Vice-Chancellor. Its members are:

- Axel Börsch-Supan - Director of the Max Planck Institute for Social Law and Social Policy in Munich
- Arne Tausen - Director of the Max Planck Institute for Evolutionary Biology in Plön;
- Kenneth Wachter, University of California Berkeley - member of the U.S. National Academy of Sciences and former Chair of the External Scientific Committee of the Max Planck Institute of Demographic Research.
- Jane Falkingham - University of Southampton, Dean of the Faculty of Social, Human and Mathematical Sciences, Director of the U.K. Centre on Population Change, President of the European Association for Population Studies,
- Deborah Roach - Professor of Biology at the University of Virginia Charlottesville, past President of the Evolutionary Demography Society, co-author of a book in press about Biodemography.
- Søren Fiig Jarner, Vice President - Quantitative Research at ATP Denmark.
- Torben M. Andersen - Professor at the Department of Economics and Business Economics, Aarhus University.

2 Research output

2.1 CPop Research in Figures

In 2018, the main research focus was on advancing methods in mortality studies across the tree of life, contribution to conservation demography of endangered species, studying the causes and consequences of longer, healthier lives, analysing male-female mortality differences based on large-scale, longitudinal studies, further development of methods for more accurate mortality forecasting and its policy applications, and exploring cultural roots and perceptions of ageing and dementia.

Researchers (as of December 1, 2018)	2018
Research staff – Total	38
– Funded by CPop (UK 10)	18
– Funded by external grants (UK 95)	17
– Funded by other SDU resources (UK 10)	6
Professors	5
Associate Professors	6
Assistant Professors and Post-Docs	13
PhD fellows	12
Research Assistants	2

Publications	2018
Contribution to journal - Journal article	35
Contribution to journal – Letter	2
Contribution to journal – Review	2
Book/anthology/thesis/report – Book	1
Chapter in Book/Report/Conference proceeding - Book chapter	1

Research events	2018
CPop Research seminars presentations (Sept. – Dec. 2018)	14
Visiting lecturers/ researchers (Sept. – Dec. 2018)	7



2.2 Publication Highlights

From more than three dozen of peer-reviewed publications produced by CPop researchers in 2018, the following are highlighted. They represent academic excellence, interdisciplinarity and successful cross-faculty collaboration of CPop researchers.

Barbi, E., Lagona, F., Marsili, M., **Vaupel, J. W.**, & Wachter, K. W. (2018). The plateau of human mortality: Demography of longevity pioneers. *Science*, 360(6396), 1459-1461.

<https://doi.org/10.1126/science.aat3119>

Abstract: Theories about biological limits to life span and evolutionary shaping of human longevity depend on facts about mortality at extreme ages, but these facts have remained a matter of debate. Do hazard curves typically level out into high plateaus eventually, as seen in other species, or do exponential increases persist? In this study, we estimated hazard rates from data on all inhabitants of Italy aged 105 and older between 2009 and 2015 (born 1896–1910), a total of 3836 documented cases. We observed level hazard curves, which were essentially constant beyond age 105. Our estimates are free from artifacts of aggregation that limited earlier studies and provide the best evidence to date for the existence of extreme-age mortality plateaus in humans.

Zarulli, V., Barthold Jones, J. A., Okusuzyan, A., **Lindahl-Jacobsen, R.**, Christensen, K., & **Vaupel, J. W.** (2018). Women live longer than men even during severe famines and epidemics. *Proceedings of the National Academy of Sciences of the United States of America*, 115(4), E832-E840.

<https://doi.org/10.1073/pnas.1701535115>

Abstract: Women in almost all modern populations live longer than men. Research to date provides evidence for both biological and social factors influencing this gender gap. Conditions when both men and women experience extremely high levels of mortality risk are unexplored sources of information. We investigate the survival of both sexes in seven populations under extreme conditions from famines, epidemics, and slavery. Women survived better than men: In all populations, they had lower mortality across almost all ages, and, with the exception of one slave population, they lived longer on average than men. Gender differences in infant mortality contributed the most to the gender gap in life expectancy, indicating that newborn girls were able to survive extreme mortality hazards better than newborn boys. Our results confirm the ubiquity of a female survival advantage even when mortality is extraordinarily high. The hypothesis that the survival advantage of women has fundamental biological underpinnings is supported by the fact that under very harsh conditions females survive better than males even at infant ages when behavioral and social differences may be minimal or favor males. Our findings also indicate that the female advantage differs across environments and is modulated by social factors.

Rizzi, S., Halekoh, U., Thinggaard, M., Engholm, G., Christensen, N., Johannesen, T. B., & **Lindahl-Jacobsen, R.** (2018). How to estimate mortality trends from grouped vital statistics. *International Journal of Epidemiology*.

Abstract:

Background: Mortality data at the population level are often aggregated in age classes, for example 5-year age groups with an open-ended interval for the elderly aged 85+. Capturing detailed age-specific mortality patterns and mortality time trends from such coarsely grouped data can be problematic at older ages, especially where open-ended intervals are used.

Methods: We illustrate the penalized composite link model (PCLM) for ungrouping to model cancer mortality surfaces. Smooth age-specific distributions from data grouped in age classes of adjacent calendar years were estimated by constructing a two-dimensional regression, based on B-splines, and maximizing a penalized likelihood. We show the applicability of the proposed model, analysing age-at-death distributions from cancers of all sites in Denmark from 1980 to 2014. Data were retrieved from the Danish Cancer Society and the Human Mortality Database.

Results: The main trends captured by PCLM are: (i) a decrease in cancer mortality rates after the 1990s for ages 50–75; (ii) a decrease in cancer mortality in later cohorts for young ages, especially, and very advanced ages. Comparing the raw data by single year of age, with the PCLM-ungrouped distributions, we clearly illustrate that the model fits the data with a high level of accuracy.

Conclusions: The PCLM produces detailed smooth mortality surfaces from death counts observed in coarse age groups with modest assumptions, that is Poisson distributed counts and smoothness of the estimated distribution. Hence, the method has great potential for use within epidemiological research when information is to be gained from aggregated data, because it avoids strict assumptions about the actual distributional shape.

Ahrenfeldt, L. J., Möller, S., Hvidt, N. C., & [Lindahl-Jacobsen, R.](#) (2018). Religiousness and lifestyle among Europeans in SHARE. *Public Health*, 165, 74-81.

<https://doi.org/10.1016/j.puhe.2018.09.009>

Abstract:

Religiousness is associated with longevity and better physical health, which may be due to lifestyle choices. Here, we examine associations between religiousness and health, explained by lifestyle.

Study design: This is a longitudinal study.

Methods: Data came from 23,864 people aged 50 and above included in the Survey of Health, Ageing and Retirement in Europe in 2004–2005 and followed up during 11 years.

Results: Praying and taking part in a religious organization were associated with lower odds of smoking [odds ratio (OR) = 0.82, 95% confidence interval (CI): 0.73, 0.92 and 0.61, 95% CI: 0.53, 0.70], alcohol consumption (OR = 0.71, 95% CI: 0.64, 0.78 and OR = 0.76, 95% CI: 0.67, 0.85), physical inactivity (OR = 0.88, 95% CI: 0.79, 0.98 and OR = 0.54, 95% CI: 0.48, 0.61), and doing no vigorous physical activity (OR = 0.92, 95% CI: 0.85, 0.98 and OR = 0.63, 95% CI: 0.58, 0.68). Furthermore, religious organizational involvement lowered the odds of sleep problems (OR = 0.83, 95% CI: 0.76, 0.91), whereas being religiously educated lowered the odds of high body weight (OR = 0.87, 95% CI: 0.79, 0.96). The more religious (people who prayed, took part in a religious organization and were religiously educated) had lower odds of smoking, alcohol consumption, physical inactivity, and sleep problems than other respondents, and compared with people who only prayed, they had lower odds of smoking, physical inactivity, and sleep problems. People who only prayed had lower odds of alcohol consumption but higher odds of sleep problems than the non-religious.

Conclusions: This study confirms that the positive relations between religiousness and health to an important degree can be explained by lifestyle.

2.3 List of All Peer-Reviewed Publications

2.3.1 Contribution to journal - Journal article

Potential gains in life expectancy by reducing inequality of lifespans in Denmark: an international comparison and cause-of-death analysis

[Aburto, J. M.](#), [Wensink, M. J.](#), van Raalte, A. & [Lindahl-Jacobsen, R.](#), 2018, In: BMC Public Health. 18, 9 p., 831.

Lifespan dispersion in times of life expectancy fluctuation: the case of Central and Eastern Europe

[Aburto, J. M.](#) & van Raalte, A., 2018, In: Demography. 55, 6, p. 2071–2096

Trends in avoidable mortality over the life course in Mexico, 1990–2015: a cross-sectional demographic analysis

[Aburto, J. M.](#), Riffe, T. & Canudas-Romo, V., 2018, In: BMJ Open. 8, 7, 11 p., e022350.

Religiousness and Diseases in Europe: Findings from SHARE

Ahrenfeldt, L. J., Hvidt, N. C., Kjølner, S. T., Möller, S. & [Lindahl-Jacobsen, R.](#), 2018, In: Journal of Religion and Health.

Religiousness and lifestyle among Europeans in SHARE

Ahrenfeldt, L. J., Möller, S., Hvidt, N. C. & [Lindahl-Jacobsen, R.](#), Oct 2018, In: Public Health. 165, p. 74-81.

Latin American convergence and divergence towards the mortality profiles of developed countries

[Alvarez, J-A.](#), [Aburto, J. M.](#) & Canudas-Romo, V., 2018, (In preparation) In: Demography.

Diet has independent effects on the pace and shape of aging in *Drosophila melanogaster*

Archer, C. R., [Basellini, U.](#), Hunt, J., Simpson, S. J., Lee, K. P. & [Baudisch, A.](#), 2018, In: Biogerontology. 19, 1, p. 1-12.

The plateau of human mortality: Demography of longevity pioneers

Barbi, E., Lagona, F., Marsili, M., [Vaupel, J. W.](#) & Wachter, K. W., 29 Jun 2018, In: Science. 360, 6396, p. 1459-1461

Among-strain consistency in the pace and shape of senescence in duckweed

Barks, P. M., Dempsey, Z. W., Burg, T. M. & Laird, R. A., Sep 2018, In: *Journal of Ecology*. 106, 5, p. 2132-2145.

Complexity of the relationship between life expectancy and overlap of lifespans

Barthold Jones, J. A., Lenart, A. & **Baudisch, A.**, 2018, In: *PLOS ONE*. 13, 7, e0197985.

Sutter, A., Barton, S., Sharma, M. D., **Basellini, U.**, Hosken, D. J., & Archer, C. R. (2018). Senescent declines in elite tennis players are similar across the sexes. *Behavioral Ecology*, 29(6), 1351-1358.

Coherent Modeling and Forecasting of Mortality Patterns for Subpopulations Using Multiway Analysis of Compositions: An Application to Canadian Provinces and Territories

Bergeron Boucher, M-P., Simonacci, V., **Oeppen, J.** & Gallo, M., 10 Jan 2018, In: *The North American Actuarial Journal*. 22, 1, p. 92-118

Modeling and forecasting sex differences in mortality: a sex-ratio approach

Bergeron-Boucher, M. P., Canudas-Romo, V., **Pascariu, M. & Lindahl-Jacobsen, R.**, 1 Dec 2018, In: *Genus: Journal of Population Sciences*. 74, 28 p., 20.

Bioturbation and directionality in Earth's carbon isotope record across the Neoproterozoic–Cambrian transition

Boyle, R. A., Dahl, T. W., Bjerrum, C. J. & **Canfield, D. E.**, 2018, In: *Geobiology*. 16, 3, p. 252-278

Matrix methods in health demography: A new approach to the stochastic analysis of healthy longevity and DALYs

Caswell, H. & **Zarulli, V.**, 7 Jun 2018, In: *Population Health Metrics*. 16, 1, 8.

Rectangularization of the survival curve reconsidered: The maximum inner rectangle approach

Ebeling, M., Rau, R. & **Baudisch, A.**, 2018, In: *Population Studies*. 72, 3, p. 369-379

Evolution of fixed demographic heterogeneity from a game of stable coexistence

Gaiimo, S., Li, X-Y., Traulsen, A. & **Baudisch, A.**, 2018, In: *Demographic Research*. 38, 8, p. 197-226

Hvem kan tale for prekariatet – og hvorfra? In the Ghetto med Kristian Bang Foss, Morten Pape, Yahya Hassan, Karina Pedersen og prinsesserne fra blokken

Haarder, J. H., [Simonsen, P.](#) & Schwartz, C., 2018, In: Edda. 105, 3, p. 185-202

Sex differences in the 1-year risk of dying following all-cause and cause-specific hospital admission after age 50 in comparison with a general and non-hospitalized population: a register-based cohort study of the Danish population

Höhn, A., Larsen, L. A., Schneider, D. C., [Lindahl-Jacobsen, R.](#), Rau, R., Christensen, K. & Oksuzyan, A., 17 Jul 2018, In: BMJ Open. 8, 7, 9 p., e021813.

Demographic variability and heterogeneity among individuals within and among clonal bacteria strains

[Jouvet, L.](#), Rodriguez-Rojas, A. & Steiner, U., 2018, In: Oikos. 127, 5, p. 728–737

Comparison of cognitive and physical functioning of Europeans in 2004-05 and 2013

Juel Ahrenfeldt, L., [Lindahl-Jacobsen, R.](#), [Rizzi, S.](#), Thinggaard, M., Christensen, K. & [Vaupel, J. W.](#), Oct 2018, In: International Journal of Epidemiology. 47, 5, p. 1518-1528

Russian periphery is dying in movement: a cohort assessment of internal youth migration in Central Russia

[Kashnitsky, I.](#), 22 Nov 2018, In: GeoJournal.

Contraction dynamics and respiration of small single-osculum explants of the demosponge *Halickechondria panicea*

Kumala, L. & [Canfield, D. E.](#), Nov 2018, In: Frontiers in Marine Science. 5, 410, p. 1-11

Semen quality associated with subsequent hospitalizations: Can the effect be explained by socio-economic status and lifestyle factors?

Latif, T., [Lindahl-Jacobsen, R.](#), Mehlsen, J., Eisenberg, M. L., Holmboe, S. A., Pors, K., Brinth, L., Skouby, S. O., Jørgensen, N. & Jensen, T. K., 2018, In: Andrology. 6, 3, p. 428-435

The last common ancestor of animals lacked the HIF pathway and respired in low-oxygen environments

Mills, D. B., Francis, W. R., Vargas, S., Larsen, M., Elemans, C. P. H., [Canfield, D. E.](#) & Wörheide, G., 2018, In: eLife. 7, e31176.

Surgical treatment versus conventional chest tube drainage in primary spontaneous pneumothorax: a randomized controlled trial

Olesen, W. H., Katballe, N., Sindby, J. E., Titlestad, I. L., Andersen, P. E., [Lindahl-Jacobsen, R.](#) & Licht, P. B., 1 Jul 2018, In: European journal of cardio-thoracic surgery : official journal of the European Association for Cardio-thoracic Surgery. 54, 1, p. 113-121

The double-gap life expectancy forecasting model

[Pascariu, M.](#), Canudas-Romo, V. & [Vaupel, J. W.](#), 2018, In: Insurance: Mathematics and Economics. 78, p. 339-350

ungroup: An R package for efficient estimation of smooth distributions from coarsely binned data

[Pascariu, M.](#), Danko, M., [Schöley, J.](#) & [Rizzi, S.](#), 20 Sep 2018, In: The Journal of Open Source Software. 3, 29, 937. [Rizzi, S.](#), Halekoh, U., Thinggaard, M., Engholm, G., Christensen, N., Johannesen, T. B., & [Lindahl-Jacobsen, R.](#) (2018). How to estimate mortality trends from grouped vital statistics. International Journal of Epidemiology.

Forestillingen om at tingene var indrettet anderledes: Helle Helles arbejderlitteratur

[Simonsen, P.](#), 2018, In: SPRING - tidsskrift for moderne dansk litteratur. 43, p. 49-69

Saving samples, saving species: Why the EAZA Biobank is a crucial weapon in the fight to save species and create sustainable populations

[Stärk, J.](#) & [Conde, D. A.](#), Jun 2018, In: Zooquaria. 101, 2 p.

Demographic responses to climate variation depend on spatial- and life history-differentiation at multiple scales

Tye, M., Dahlgren, J. P., Øien, D. I., Moen, A. & Sletvold, N., Dec 2018, In: Biological Conservation. 228, p. 62-69

Naturalist Sentimentalism: Ageing Between Hopefulness and Decline in Rebecca Harding Davis's Short Fiction

Wohlmann, A., 2018, In: European Journal of English Studies. 22, 1, p. 28-45

Women live longer than men even during severe famines and epidemics

Zarulli, V., Barthold Jones, J. A., Oksuzyan, A., **Lindahl-Jacobsen, R.**, Christensen, K. & **Vaupel, J. W.**, 2018, In: Proceedings of the National Academy of Sciences of the United States of America. 115, 4, p. E832-E840

Sex Differences in Genetic Associations With Longevity

Zeng, Y., Nie, C., Min, J., Chen, H., Liu, X., Ye, R., Chen, Z., Bai, C., Xie, E., Yin, Z., Lv, Y., Lu, J., Li, J., Ni, T., Bolund, L., Land, K. C., Yashin, A. I., O'Rand, A. M., Sun, L., Yang, Z. & 22 others Tao, W., Gurinovich, A., Franceschi, C., Xie, J., Gu, J., Hou, Y., Liu, X., Xu, X., Robine, J-M., Deelen, J., Sebastiani, P., Slagboom, E., Perls, T. T., Hauser, E. R., Gottschalk, W., Tan, Q., Christensen, K., Shi, X., Lutz, M., Tian, X-L., Yang, H. & **Vaupel, J. W.**, Aug 2018, In: JAMA Network Open. 1, 4, 15 p., 1670.

2.3.2 Contribution to journal - Letter

Regional population structures at a glance

Kashnitsky, I. & Schöley, J., 21 Jul 2018, In: Lancet. 392, 10143, p. 209-210

2.3.3 Contribution to journal - Review

Towards global data products of Essential Biodiversity Variables on species traits

Kissling, W. D., Walls, R., Bowser, A., Jones, M. O., Kattge, J., Agosti, D., Amengual, J., Basset, A., van Bodegom, P. M., Cornelissen, J. H. C., Denny, E. G., Deudero, S., Egloff, W., Elmendorf, S. C., Alonso García, E., Jones, K. D., **Jones, O. R.**, Lavorel, S., Lear, D., Navarro, L. M. & 9 others Pawar, S., Pirzl, R., Rüger, N., Sal, S., Salguero-Gómez, R., Schigel, D., Schulz, K-S., Skidmore, A. & Guralnick, R. P., Sep 2018, In: Nature Ecology & Evolution. 2, 10, p. 1531-1540

Skimming the surface: duckweed as a model system in ecology and evolution

Laird, R. A. & **Barks, P. M.**, Dec 2018, In: American Journal of Botany. 105, 12, p. 1962-1966

2.3.4 Book/anthology/thesis/report - Book

A revision of the Old World Black Nightshades (Morelloid clade of *Solanum* L., Solanaceae)

Särkinen, T., Poczai, P., Barboza, G. E., van der Weerden, G. M., **Baden, M.** & Knapp, S., 2018, Pensoft Publishers. 223 p. (PhytoKeys; No. 106).

2.3.5 Chapter in Book/Report/Conference proceeding - Book chapter

Teenage Nostalgia: Perpetual Adolescents in Little Children and Young Adult

Wohlmann, A., 2018, *Reinventing Childhood Nostalgia: Books, Toys, and Contemporary Media Culture*. Wesseling, E. (ed.). Routledge, p. 221-240

Source: SDU PURE database, extracted on February 14, 2019.



3 Teaching

3.1 European Doctoral School of Demography

CPOP is hosting for the second year international [European Doctoral School of Demography](#) in collaboration with Max Planck Institute for Demographic Research and several European universities. The mission is to provide new doctoral students at European universities with an opportunity to pursue advanced research in demography—and hence to help educate the next generation of demographers. By contributing lecturers for the program and funding for the students, the EDSD consortium of European demography institutes and departments enables EDSD to present advanced courses to a cohort of doctoral students who benefit from studying together and from getting a deep understanding of demographic research. In the academic year 2018/19 SDU is hosting 15 students of 10 different nationalities. Teaching is provided by CPOP researchers and 15 visiting lecturers from European, US, and Australian Universities. In the academic year 2019/2020 EDSD will be hosted by the Centre for Population Studies of Autonomous University in Barcelona.

3.2 Talent Programme ‘Radical Rethink!’

CPOP is developing a brand new SDU Talent program “**Radical Rethink! The Future of Aging Societies**”, initiated and developed by Annette Baudisch. Radical Rethink! is a one-year extra-curricular talent programme for ambitious and forward-looking students who wish to integrate their unique abilities within interdisciplinary talent teams. Student teams are challenged to create new ideas that breach boundaries and paradigms to approach solutions of burning issues in aging societies of the 21st century.

Radical Rethink! will see its first student cohort in 2019 with innovative interdisciplinary teaching program contributed by lecturers from across SDU faculties.

3.3 Courses and other teaching activities overview

CPOP core and affiliated researchers teach in the below listed courses in all four faculties.

Note: List of courses taught by CPOP affiliates was extracted from PURE on February 14, 2019. May not reflect the full range of courses taught by CPOP affiliates as individual researchers are responsible for updating their teaching in PURE.

BB837 Biodiversity: Protection and Management

Dalia Amor Conde & Rita Silva

12/04/2018 → 20/04/2018

SPMM801, Masters thesis in Applied Mathematics

Fernando Colchero

01/09/2018 → 01/06/2019

ST813: Statistical Modeling

Fernando Colchero

01/02/2018 → 01/06/2018

BB512 Population and evolution

Owen Jones & Thomas Bjørneboe Berg

11/09/2018 → 05/12/2018

MM556: Mathematics and Statistics for Pharmacists

Fernando Colchero

01/09/2018 → 15/12/2018

BB839: Planning and evaluation of biological studies

Uli Steiner & Owen Jones

03/09/2018 → 12/12/2018

MM554: Mathematics for Biologists

Fernando Colchero

01/09/2018 → 15/12/2018

Demography and Economics

Virginia Zarulli

06/09/2018 → ...

Master thesis in Mathematical Economy

Fernando Colchero

01/02/2018 → 01/06/2018

Demography with R

Marie-Pier Bergeron Boucher

02/07/2018 → 06/07/2018

EUROPEAN DOCTORAL SCHOOL OF DEMOGRAPHY

THE EDS IS AN INNOVATIVE COLLABORATION OF DEMOGRAPHIC INSTITUTES AND UNIVERSITY DEPARTMENTS ACROSS EUROPE. ITS MISSION IS TO EDUCATE THE NEXT GENERATION OF DEMOGRAPHERS. — **IT IS FREE AND YOU GET FULL FELLOWSHIPS.**

1 FREE EDUCATION **2** FIND A JOB AFTER **3** APPLY NOW

In demography at great locations. Odense, Denmark in 2018. No tuition, full scholarships.

Job recruitment through the network across Europe and globally.

For Sep 2018 admission. Details about the requirements: WWW.EDS-DEMOGRAPHY.ORG

“ WHERE YOUR INTERESTS AND ASPIRATIONS MEET THE OPPORTUNITIES IN AN INTERNATIONAL ENVIRONMENT.”
Virginia Zarulli, Italy

“ EDS INTRODUCED ME TO A WORLDWIDE RESEARCH NETWORK.”
Jonas Schöley, Germany

Previous EDS students now working at MaxQ

FOR FURTHER INFORMATION GO TO WWW.EDS-DEMOGRAPHY.ORG

4 Awards

Three CPop researchers received important awards for their research (José Manuel Aburto, Ilya Kashnitsky), research communication (Ilya Kashnitsky), and life-long contribution to the field of population studies (James Vaupel).

European Association for Population Studies (EAPS) Award for Population Studies

James W. Vaupel (Recipient), 9 Jun 2018. This is the highest award of the European Association for Population Studies; James Vaupel is the third recipient.

European Association for Population Studies (EAPS) Outreach Award for Communication in Population Science

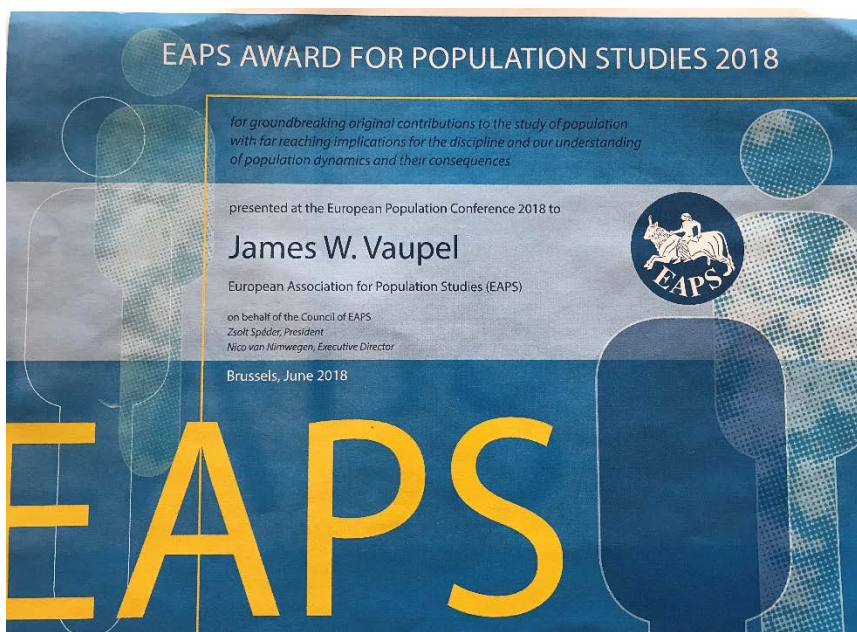
Ilya Kashnitsky (Recipient), Jun 2018

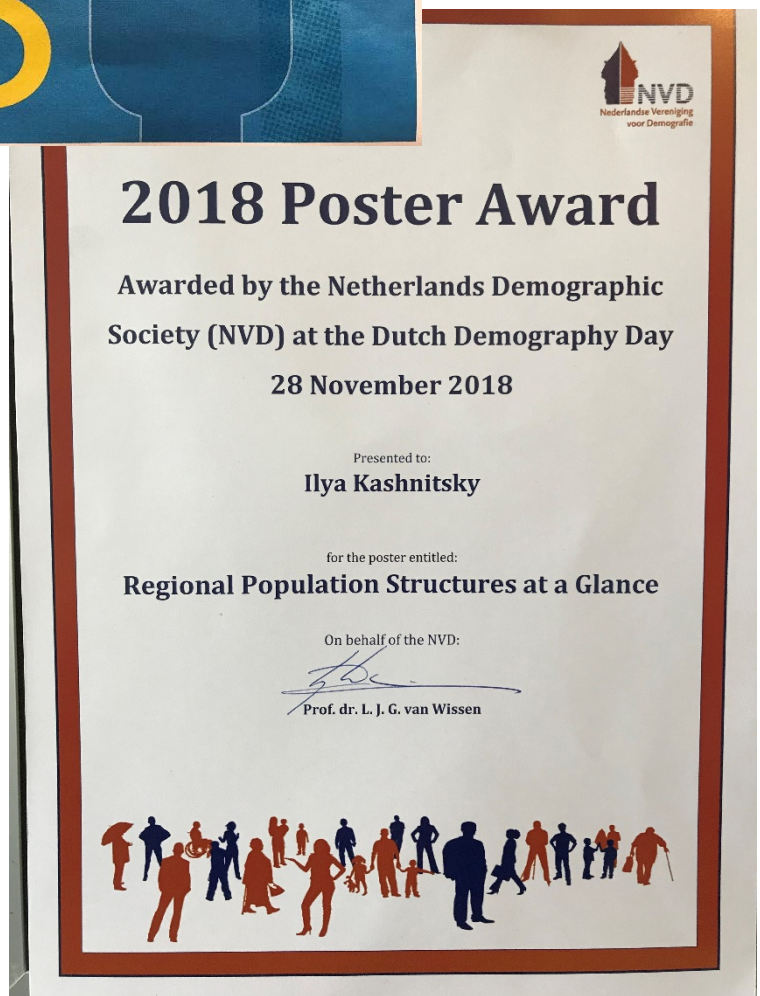
NVD Poster Award

Ilya Kashnitsky & Jonas Schöley (Recipient), 23 Nov 2018

Population Association of America Annual Conference PAA 2018 POSTER SESSION WINNER

José Manuel Aburto (Recipient), 28 Apr 2018





5 Outreach

5.1 Workshop on Mortality Forecasting in Denmark

On December 10, CPop Kernel organized Workshop on ***Forecasting Danish Life Expectancy and Age at Retirement*** that focused on the presentation and discussion of the most suitable models that can forecast Danish life expectancy and age at retirement. The aim of the workshop was to compare the performance of the models used by Danish public policy with alternatives that could deliver more accurate forecasts. Among the presenters were key persons from Statistics Denmark, the DREAM group producing official Danish forecasts, ATP and SCOR insurance companies and researchers from Aarhus and Copenhagen universities as well as CPop researchers. The aim is to establish collaboration with the major Danish stakeholders around improving Danish mortality forecasting tools.

5.2 Press and Media presence

CPop researchers and their research was cited in 130 articles in newspaper, radio and TV outlets ranging from Odense Ugeavisen to The Times. For a complete list see Annex 1.



6 People

The following list of CPop affiliates indicate those who have been paid from CPop budget UK10 (*), external grants UK95 (\$), or other SDU resources UK10 (#) or affiliated otherwise such as leaders of Cpop faculty units between September and December 2018.

Name	Position	CPop Unit	Funded by
James W. Vaupel	CPop Director, Professor	Kernel	*
Annette Baudisch	Deputy Director, Professor MSO	Kernel	*
Helle Bisgaard Jensen	Communication Officer - Talent p.	Kernel	#
Virginia Zarulli	Assistant Professor	Kernel	\$
Jim Oeppen	Associate Professor	Kernel	*
Jana Vobecka	Chief Academic Administrator	Kernel	*
Anthony Medford	PhD student	Kernel	*
Jana Vobecká	Chief Academic Officer	Kernel	*
Catalina Torres	PhD student	Kernel	\$
Jesús-Adrian Álvarez	PhD student	Kernel	#
Jonas Schöley	PhD student	Kernel	\$
José Manuel Aburto	PhD student	Kernel	\$
Søren Kjærgaard	PhD Student	Kernel	\$
Ugo Filippo Basellini	PhD Student	Kernel	\$
Monica Wellejus	Studenthelp	Kernel	#
Susanne Thorsen Dejligbjerg	Secretary	Kernel	*
Marius Pascariu	PhD student/ PostDoc	Kernel	\$
Francisco Villavicencio	PostDoc	Kernel	\$
Marie-Pier Bergeron Boucher	PostDoc	Kernel	\$
Ilya Kashnitsky	Research Assistant	Kernel	*
Susanne Thorsen Dejligbjerg	Secretary	Kernel	*
Maarten Wensink	Assistant Professor	CPop SUND	*
Rune Lindahl-Jacobsen	Associate Professor	CPop SUND	#
Camilla Riis Nielsen	PhD Student	CPop SUND	#
Silvia Rizzi	Postdoc	CPop SUND	*

(continued)

Name	Position	CPop Unit	Funded by
Seetha Menon	Assistant Professor	CPop SAM	*
Christian Møller Dahl	Professor	CPop SAM	#
Fernando Colchero	Associate Professor	CPop NAT	*
Dalia Amor Conde	Associate Professor	CPop NAT	*/\$
Johan Dahlgren	Associate Professor	CPop NAT	*
Owen Jones	Associate Professor	CPop NAT	*
Ana Rita da Silva	PhD Student	CPop NAT	*
Gesa Römer	PhD Student	CPop NAT	*/\$
Maria Baden	PhD Student	CPop NAT	\$
Iain Stott	Postdoc	CPop NAT	\$
Johanna Stärk	Postdoc	CPop NAT	\$
Julia Jones	Postdoc	CPop NAT	*
Patrick Barks	Postdoc	CPop NAT	\$
Stina Edelfeldt	Postdoc	CPop NAT	\$
Donald Canfield	Professor	CPop NAT	#
Lionel Jouvét	Research Assistant	CPop NAT	*/\$
Anita Wohlmann	Assistant Professor	CPop HUM	*
Alastair Morrison	Assistant Professor	CPop HUM	*
Peter Simonsen	Professor	CPop HUM	#

Note: Funded by: CPop budget UK10 (*), external grants UK95 (\$), or other SDU resources UK10 (#).



7 Budget & Fundraising

7.1 CPop budget overview

SDU budget (UK10) available resources, in thousands DKK

CPop Budget	SDU Frirums		Total
	pulje	SDU faculty	
CPop Kernel	8.000	–	8.000
CPop HUM	500	1.000	1.500
CPop NAT	500	2.500	3.000
CPop SAM	500	2.500	3.000
CPop SUND	330	1.600	1.930
Total	9.830	7.600	17.430

Structure of CPop budget spending **by source of income**

	SDU			External funding	Total
	Frirumspulje	SDU faculty	SDU other		
- in thousands DKK					
CPop Kernel	3.401	–	45	1.560	5.006
CPop NAT	241	3.759	0	2.664	6.664
CPop SAM	0	201	0	0	201
CPop SUND	397	1.688	0	0	2.085
CPop HUM	NA	NA	NA	NA	NA
Total	4.039	5.648	45	4.224	13.956
- in % of total spending					
CPop Kernel	67,9	–	0,9	31,2	100,0
CPop NAT	3,6	56,4	0,0	40,0	100,0
CPop SAM	0,0	100,0	0,0	0,0	100,0
CPop SUND	19,0	81,0	0,0	0,0	100,0
CPop HUM	NA	NA	NA	NA	NA
Total	28,9	40,5	0,3	30,3	100,0

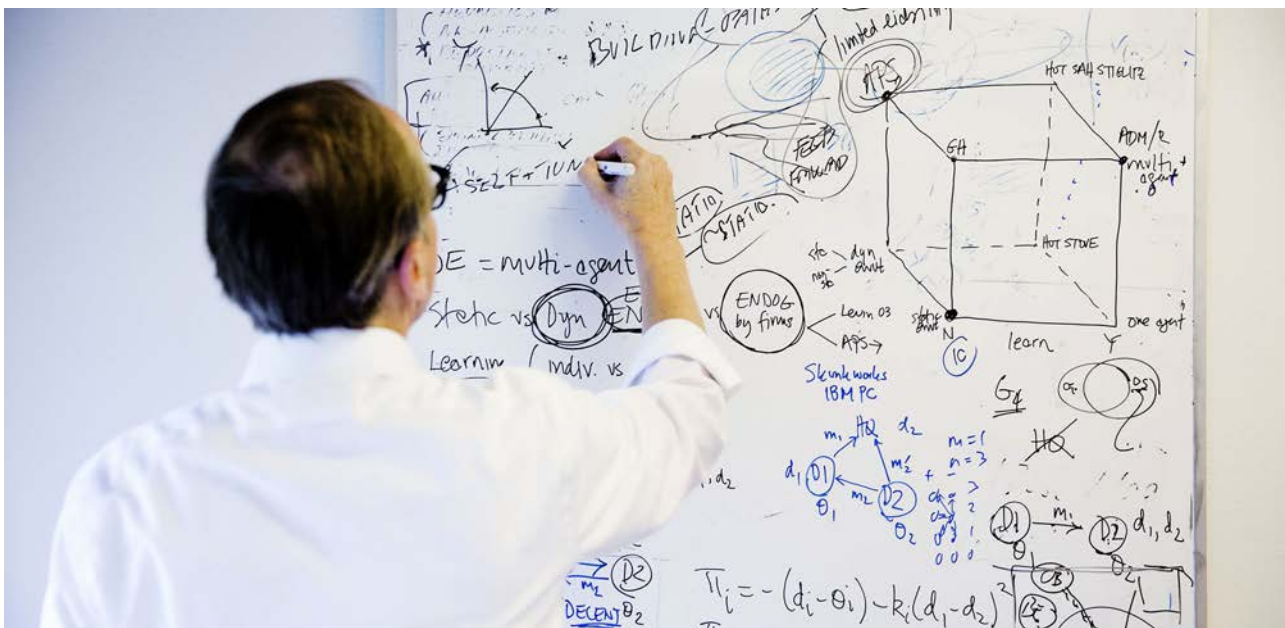
Note: NA, CPop HUM unit spending overview was unavailable by the deadline.

Structure of CPop budget **by type of spending**, in thousands DKK

	CPop Kernel	CPop NAT	CPop SAM	CPop SUND	CPop HUM	Total
Persons - Research staff	2.883	6.033	170	1.711	NA	10.797
Persons - Admin Staff	433	166	—	250	NA	849
Operational costs	390	465	31	124	NA	1.010
Kernel compensation NAT & SUND	1.300	—	—	—	—	1.300
Total	5.006	6.664	201	2.085	NA	13.956

Note: NA, CPop HUM unit spending overview was unavailable by the deadline.

CPop shows a strong capacity for generating external research funds. **In the first year of its operation 30 % of CPop total costs were covered by external funding.** Administrative and operational costs of the Centre fell well below 10 % of total costs. Due to its capacity to draw from external funds and its delayed launch, CPop generated savings. These will be used in the coming years for new hiring.



7.2 Fundraising: External grants of CPop Affiliates

Principal investigator	Project name	Founder	Start date	End date	Total amount granted (DKK)
Dalia Amor Conde	Samarbejdsaftale mellem Species360 og SDU	Species360	01-03-2017	31-12-2021	4.330.770
Dalia Amor Conde	Donation fra Species360 - Dalia Amore Conde	Species360	01-03-2018	31-08-2022	2.502.357
Donald Canfield	Microbial oceanography of the oxygen-deficient waters of the eastern tropical South Pacific	Agouron Intitue	01-08-2007	31-12-2023	4.485.210
Donald Canfield	Life at Low Oxygen	Uddannelses- og Forskningsministeriet	31-12-2015	31-12-2018	2.459.520
Donald Canfield	The development environment and its controlling factors for ancient hydrocarbon source rocks	PetroChina Research Institute of Petroleum Exploration & Development (RIPED)	01-01-2016	31-12-2023	1.100.000
Donald Canfield	Center for Environmental and Biological Evolution (EnBiE)	Villum Fonden	01-07-2017	30-06-2023	37.861.450
Gesa Römer	Oikos Travel Grant - Stina Edelfeldt og Gesa Römer	Nordic Society OIKOS	20-02-2018	22-02-2018	6.000
James W. Vaupel	AXA-Chair Agreement	AXA Research Fund	01-04-2015	31-12-2025	7.457.400
James W. Vaupel	Male/Female Project 1 "Demography of Sex differences in Health and Survival"	NIH - National Institute of Health	15-09-2016	30-04-2021	6.365.000
James W. Vaupel	AARP Longevity Update	AARP	01-03-2018	20-12-2018	384.500
James W. Vaupel	AXA Chair (SAMF)	AXA Research Fund	01-12-2018	15-03-2025	8.940.000
Jana Vobecká & Virginia Zarulli	EDSD support to international lecturers 2018	European Association for Population Studies EAPS	26-10-2018	01-10-2019	37.350
Johan Dahlgren	SEAD-Plant: Stage, Environment and Age-dependent Demography of Plants	Uddannelses- og Forskningsministeriet	01-11-2016	31-10-2020	7.036.704
Johan Dahlgren	Towards more realistic predictions of the effects of climate and land use changes on species distributions	Sveriges forskningsråd (Vetenskapsrådet) FORMAS	01-01-2017	31-12-2019	100.245
Marius Pascariu	SCOR, "Modelling and forecasting age specific death rates at older ages	The SCOR Corporate Foundation for Science	01-03-2016	28-02-2019	2.000.000
Owen Jones	Modelling demographic responses to climate change across the animal and plant kingdoms	Uddannelses- og Forskningsministeriet	01-12-2016	31-07-2020	2.547.360
Owen Jones	Could senescence be adaptive? causes and consequences of aging across the tree of life	EU - Horizon 2020, MSCA - Marie Skłodowska-Curie actions, Individual Fellowship	01-05-2017	31-08-2019	1.491.451

8 Annexes

Annex 1: Press and Media Presence

Bliv klogere på ældrelitteratur og livslange liv

18/04/2018

Fyens Stiftstidende

Peter Simonsen

Bliv klogere på ældrelitteratur og livslange liv

19/04/2018

Fyens Stiftstidende

Peter Simonsen

Bob Dylan-konference trak internationale litteraturskperter til Odense

10/10/2018

Kristeligt Dagblad

Alastair Morrison

Bob Dylan-konference trak internationale litteraturskperter til Odense

10/10/2018

Kristeligt Dagblad - Login

Alastair Morrison

Børnebøger, børnebørn og demens

19/06/2018

Ugeavisen Odense

Peter Simonsen

Brugslitteratur

02/11/2018

Weekendavisen

Peter Simonsen

Hungersnød, epidemier eller slavearbejde: Kvinder overlever det bedre end mænd

14/01/2018

Jyllands-Posten

Virginia Zarulli

Fremtiden fyldes af enker med dårligt helbred

13/01/2018

Fyens Amtsavis

Virginia Zarulli

Selv under de værste livsforhold klarer kvinder sig bedre end mænd

10/01/2018

Sundhedspolitisk Tidsskrift <http://sundhedspolitisktidsskrift.dk/nyheder/567-selv-under-de-vaerste-livsforhold-klarere-kvinder-sig-bedre-end-maend.html>

Virginia Zarulli

Ny SDU-forskning: Selv under de værste livsforhold klarer kvinder sig bedre end mænd

10/01/2018

TV2 Fyn, Denmark <https://www.tv2fyn.dk/artikel/ny-sdu-forskning-selv-under-de-vaerste-livsforhold-klarere-kvinder-sig-bedre-end-maend>

Virginia Zarulli

Fremtiden fyldes af enker med dårligt helbred

10/01/2018

Fyens.dk, <https://www.fyens.dk/indland/Ny-forskning-fra-SDU-Fremtiden-fyldes-af-enker-med-daarligt-helbred/artikel/3220474>

Virginia Zarulli

Fremtiden fyldes af enker med dårligt helbred

10/01/2018

Fyens Stiftstidende

Virginia Zarulli

Kvinderne ER det stærkeste køn - og her er beviset

10/01/2018

TV2 Nyhederne <http://nyheder.tv2.dk/2018-01-10-kvinder-er-det-staerkeste-koen-og-her-er-beviset>

Virginia Zarulli

På dette punkt er kvinder stærkere end mænd

10/01/2018

Newsner.com <https://dk.newsner.com/nyheder/ny-forskning-paa-dette-punkt-er-kvinder-staerkere-end-maend/>

Selv under de værste livsforhold klarer kvinder sig bedre end mænd

10/01/2018

Propatienter

Virginia Zarulli

Den er god nok: Mænd er det svage køn

09/01/2018

Politiken

Virginia Zarulli

Danske forskere afgør sagen: Mænd er det svage køn
08/01/2018

Politiken.dk <https://politiken.dk/viden/Vi-den/art6284440/Mænd-er-det-svage-køn>

Virginia Zarulli

Den store befolkningsvækst er en myte
13/06/2018

Kristeligt Dagblad

James W. Vaupel

Derfor lever kvinder længere end mænd
05/04/2018

Kristeligt Dagblad

Virginia Zarulli

Derfor lever kvinder længere end mænd
05/04/2018

Kristeligt Dagblad - Login

Virginia Zarulli

Fond giver kæmpedonation til SDU
01/07/2018

Fyens Stiftstidende

Peter Simonsen

Kæmpedonation til SDU
02/07/2018

Fyens Stiftstidende

Peter Simonsen

Radio NORDJYSKE - Hvem er det stærkeste køn?
18/01/2018

Radio NORDJYSKE (National), Denmark, Radio

Mark Simon Russell

8 min <http://www.radionet.dk/podcast/gm00010051.mp3>

Rune Lindahl-Jacobsen

Hvem er sundest af mænd og kvinder?
27/06/2018

Samvirke

Rune Lindahl-Jacobsen

Kunsten giver en ramme til sorgen i en tid uden mange ritualer

17/03/2018

Kristeligt Dagblad

Peter Simonsen

Kvinder lever længere end mænd
28/03/2018

Ældre Sagen

Virginia Zarulli

Kvinder og piger er biologiske overlevere
21/10/2018

Videnskab.dk

Virginia Zarulli

Lad de ældre løfte byrden
19/01/2018

Weekendavisen

Søren Kjærgaard

Lad de ældre løfte byrden
19/01/2018

Weekendavisen

James W. Vaupel

Lang zullen we leven
29/06/2018

De Standaard Online

Virginia Zarulli

Map reveals how rural areas across Western Europe have lost their young people FOREVER and how Germany's fertility rate and Spain's high life expectancy have caused an ageing crisis

24/07/2018

Dailymail Online (International), United Kingdom, Web, Jordan Barnes <http://www.dailymail.co.uk/news/article-5988331/Map-reveals-Europes-population-crisis-Western-countries-ageing-younger-populations-east.html>

Jonas Schöley

Musvitter hjælper forskere
31/05/2018

Sydkysten Weekend

Owen Jones

Musvitter hjælper forskere
01/06/2018

Skive Folkeblad

Owen Jones

Musvitter hjælper forskere
02/06/2018

Midtjyllands Avis

Owen Jones

Musvitter hjælper forskere
09/06/2018

Herning Folkeblad

Owen Jones

Musvitter hjælper klimaforskere

03/06/2018

Fyns Amtsavis

Owen Jones

Nu skal vi vide mere om de allerældste

12/07/2018

Syddansk Universitet

Peter Simonsen

Musvitter hjælper klimaforskere

16/06/2018

NordVestNyt (Kalundborg)

Owen Jones

NYE BØGER

12/01/2018

Magisterbladet

Peter Simonsen

Musvitter hjælper klimaforskere

16/06/2018

Frederiksborg Amts Avis

Owen Jones

Pyskisk sårbare unge i litteraturen

13/02/2018

Folkeskolen

Peter Simonsen

Musvitter hjælper klimaforskere

16/06/2018

Dagbladet Roskilde

Owen Jones

Se her, hvor gammel du kan forvente at blive

22/08/2018

Sjællands Nyheder

Rune Lindahl-Jacobsen

Musvitter hjælper klimaforskere

16/06/2018

Sjællandske - Næstved, Faxe, Vordingborg

Owen Jones

Skal vi bremse overbefolkning for at redde verden?

11/06/2018

Videnskab.dk <https://videnskab.dk/kultur-samfund/skal-vi-bremse-overbefolkning-for-at-redde-verden>

James W. Vaupel

Musvitter hjælper klimaforskere

16/06/2018

Sjællandske - Slagelse, Sorø, Kalundborg

Owen Jones

Sundhedshumaniora rykker ud: LITTERATUR TIL LÆGER

19/03/2018

Ugeskrift for Læger

Peter Simonsen

Musvitter hjælper klimaforskere

16/06/2018

Dagbladet Ringsted

Owen Jones

Sygdomme på stribe: Voldens kastanjetræer vil forsvinde

11/09/2018

Elbo Bladet, Denmark

Johan Dahlgren

Musvitter hjælper klimaforskere

16/06/2018

NordVestNyt (Holbæk)

Owen Jones

Voldens kastanjetræer plages af sygdomme og vil med tiden forsvinde

10/09/2018

Fredericia Dagblad, Denmark

Johan Dahlgren

Musvitter hjælper klimaforskere

16/06/2018

Dagbladet Køge

Owen Jones

Sygdomme på stribe: Voldens kastanjetræer vil forsvinde

08/09/2018

Fredericia Dagblad, Denmark

Johan Dahlgren

Nee, de grens van de levensverwachting is nog niet in zicht

29/06/2018

De Standaard Online

Virginia Zarulli

Sygdomme på stribe: Voldens kastanjetræer vil forsvinde

08/09/2018

Vejle Amts Folkeblad

Johan Dahlgren

Tættere på diagnosebørn

25/02/2018

Nordjyske Stiftstidende Vendsyssel

Peter Simonsen

Tættere på diagnosebørn

25/02/2018

Nordjyske Stiftstidende Thisted Dagblad

Peter Simonsen

Tættere på diagnosebørn

25/02/2018

Nordjyske Stiftstidende Himmerland

Peter Simonsen

Tættere på diagnosebørn

25/02/2018

Nordjyske Stiftstidende Aalborg

Peter Simonsen

TORSDAG 8. MARTS

07/03/2018

Ugeavisen Odense

Peter Simonsen

Vi bliver 11 milliarder... maks!

12/06/2018

BT

James W. Vaupel

Vi bliver maks 11 milliarder

12/06/2018

MX-MetroXpress København, Denmark

James W. Vaupel

Vi bliver maks 11 milliarder

12/06/2018

MX-MetroXpress Vest, Denmark

James W. Vaupel

Fortsat befolkningsvækst er en myte

11/06/2018

Kristeligt Dagblad, Denmark <https://www.kristeligt-dagblad.dk/bagsiden/fortsat-befolkningsvaekst-er-en-myte>

James W. Vaupel

Beregning: Vi bliver ikke mere end 11 milliarder mennesker

11/06/2018

Sermitsiaq.ag, Greenland <http://sermitsiaq.ag/beregning-ikke-mere-11-milliarder-mennesker>

James W. Vaupel

Beregning: Vi bliver ikke mere end 11 milliarder mennesker

11/06/2018

Ritzau, Denmark

James W. Vaupel

Les femmes plus résistantes que les hommes

04/02/2018

La Presse, France <http://www.lapresse.ca/actualites/sciences/201802/03/01-5152562-les-femmes-plus-resistantes-que-les-hommes.php>

Virginia Zarulli

In terrible times, there's an advantage to being female

31/01/2018

Futurity, United States <http://www.futurity.org/female-survival-advantage-1667882-2/>

Virginia Zarulli & James W. Vaupel

Men Don't Survive Harsh Conditions As Well As Women Do

24/01/2018

Vice, Australia https://www.vice.com/en_au/article/7xe-agq/men-dont-survive-harsh-conditions-as-well-as-women-do

Virginia Zarulli

Forscher zeigen: Frauen waren schon immer das stärkere

Geschlecht

22/01/2018

Stern, Germany <https://www.stern.de/panorama/wissen/studie--frauen-haben-historisch-eine-hoehere-lebenserwartung-als-maenner-7831948.htm>

Virginia Zarulli

Kvinnor bättre rustade för överlevnad

20/01/2018

SVT Nyheter, Sweden <https://www.svt.se/nyheter/vetenskap/kvinnor-battre-rustade-for-overlevnad>

Virginia Zarulli

As mulheres são mesmo o sexo mais forte

19/01/2018

ZAP, Portugal <https://zap.uei.pt/sobrevivencia-as-mulheres-sao-mesmo-sexo-forte-188177>

Virginia Zarulli & James W. Vaupel

Sobrevivência em tempos de crise: as mulheres são mais resistentes do que os homens

17/01/2018

Publico, Portugal https://www.publico.pt/2018/01/17/ciencia/noticia/sobrevivencia-em-tempos-de-crise-as-mulheres-sao-mais-resistentes-do-que-os-homens-1799596?page=/&pos=2&b=latest_news_a_v2

Virginia Zarulli & James W. Vaupel

Scientists Confirm: Men Really Are the Weaker Sex
17/01/2018

SCI-TECH TODAY, United States http://www.sci-tech-to-day.com/story.xhtml?story_id=107102

Virginia Zarulli

Estudio asegura que las mujeres viven más que los hombres
16/01/2018

W Radio, Colombia http://www.wradio.com.co/escucha/archivo_de_audio/estudio-asegura-que-las-mujeres-viven-mas-que-los-hombres/20180116/oir/3691303.aspx

Virginia Zarulli

Survival advantage: From birth on, females are hardier
16/01/2018

Sott.net, United States <https://www.sott.net/article/374631-Survival-advantage-From-birth-on-females-are-hardier>

Virginia Zarulli

From Birth On, One Sex Is Hardier
16/01/2018

MedicineNet.com, United States <https://www.medicinenet.com/script/main/art.asp?articlekey=209547>

Virginia Zarulli & James W. Vaupel

Women are hardier than men, study suggests
16/01/2018

UPI - United Press International, United States https://www.upi.com/Health_News/2018/01/16/Women-are-hardier-than-men-study-suggests/8371516155306/

Virginia Zarulli & James W. Vaupel

From birth on, one sex is hardier
16/01/2018

Medical Xpress, United States

Virginia Zarulli & James W. Vaupel

From Birth On, One Sex Is Hardier
16/01/2018

Doctors Lounge, United States <https://www.doctorslounge.com/index.php/news/hd/77788>

Virginia Zarulli & James W. Vaupel

From Birth On, One Sex Is Hardier
16/01/2018

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Virginia Zarulli & James W. Vaupel

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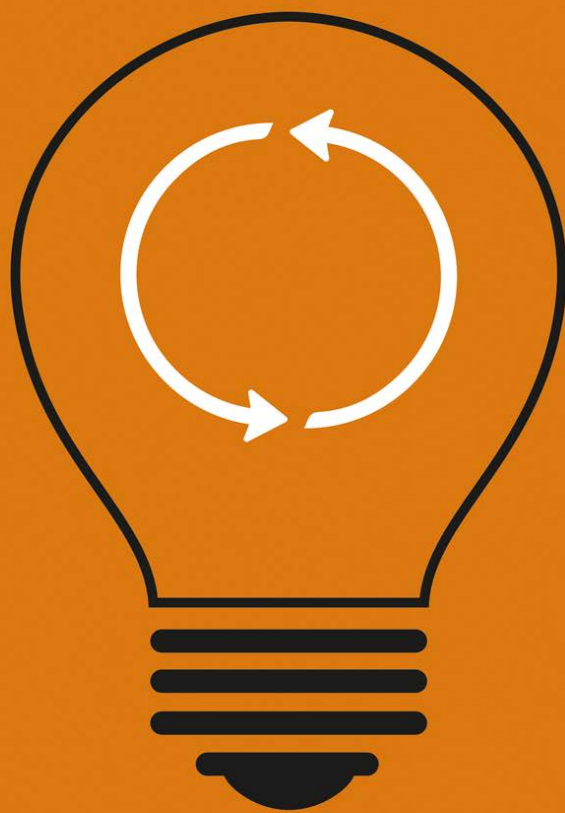
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