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| Institution: Aston University | | |
| Unit of Assessment: 3 Allied Health Professions, Dentistry, Nursing and Pharmacy | | |
| Title of case study: 4. Promoting healthy ageing in the public domain: public engagement resulting from research within the Aston Centre for Healthy Ageing (ARCHA) | | |
| Period when the underpinning research was undertaken: 2009- date | | |
| Details of staff conducting the underpinning research from the submitting unit: | | |
| Name(s): | Role(s) (e.g. job title): | Period(s) employed by submitting HEI: |
| James E.P. Brown | <ul style="list-style-type: none"> • Associate Professor in Ageing & Metabolism • Director, ARCHA • Associate Dean Public Engagement, CHLS | <p style="text-align: center;">2009-date</p> <p style="text-align: center;">2017-date</p> <p style="text-align: center;">2020-date</p> |
| Carol Holland | <ul style="list-style-type: none"> • Reader in Psychology • Director, ARCHA | <p style="text-align: center;">2001-2017</p> <p style="text-align: center;">2016-2017</p> |
| Helen R. Griffiths | <ul style="list-style-type: none"> • Pro-Vice Chancellor • Executive Dean, School of Life & Health Sciences • Founder & Director, ARCHA • Professor of Biomedical Sciences | <p style="text-align: center;">2015-2016</p> <p style="text-align: center;">2009-2014</p> <p style="text-align: center;">2009-2016</p> <p style="text-align: center;">1998-2016</p> |
| Period when the claimed impact occurred: 2017-2020 | | |
| Is this case study continued from a case study submitted in 2014? ✘/N | | |
| <p>1. Summary of the impact</p> <p>Lifespan has increased, but older adults are spending more time, proportionally, in poor health. Many older adults also suffer from memory problems that can lead to depression and anxiety. Owing to the Aston Research Centre for Health Ageing established status, and Brown's burgeoning personal reputation in biogerontology, Brown (ARCHA's director) was invited to design and analyse the scientific experiments that underpinned two Channel 4 series of "Old People's Home for 4 Year Olds". Those programmes and Brown's subsequent involvement with multiple stakeholders have led to improvements in national attitude, commercial reputation and individuals' quality of life.</p> <p>Impacts on Health & Wellbeing, Culture and Commerce are claimed.</p> | | |
| <p>2. Underpinning research</p> <p>Background: Human lifespan continues to increase in the UK, but the number of years spent in poor health is increasing yet more quickly (Office for National Statistics, 2016-2018); a challenge to individuals, their families, healthcare systems and society. Functional decline associated with the ageing process is a significant cause of morbidity (disease/other medical conditions) and mortality. In many older adults, later years are spent in frailty and/or cognitive decline. These age-related states of vulnerability are associated with increased risk of falls, disability, mental or physical illness and hospitalisation. Indeed, estimates suggest that 17.4% of the global population is frail and 49.3% 'prefrail'. Many older adults also suffer from over-general memory – a condition associated with both depression and anxiety.</p> | | |

In 2009, Griffiths founded the Aston Research Centre for Healthy Ageing (ARCHA) as an interdisciplinary centre of excellence involving biologists, psychologists, pharmacists, ophthalmologists and engineers, to engage holistically in all aspects of ageing research with the over-arching aim of achieving research contributions to good health in older adults.

Underpinning Research: Within ARCHA, from their respective backgrounds in metabolic disorders, psychology and redox biology, Brown, Holland and Griffiths have together created a body of knowledge involving the metabolism associated with ageing, the link between physical activity and biomarkers of ageing, simple interventions to reduce hospital re-admission post-discharge by the NHS and the assessment/therapy of frailty and cognitive decline in older adults.

Research Insights/Findings: Frailty is not inevitable or irreversible and has many means of detection. ARCHA research identified that a biological marker of frailty (telomere length) is influenced by irisin, an exercise hormone in healthy subjects (**S3.1**), whilst fats in the blood associated with diet and exercise can predict ageing in healthy individuals (**S3.2**). Particularly pertinent to the current pandemic, Brown, Griffiths and colleagues reviewed the role that metabolic programming and loss of redox homeostasis play during ageing in the decline of T cell function, which is thought to contribute to reduced response to infection and vaccination (**S3.3**). On the psychological front, Brown and colleagues determined that a simple phone call from a community nurse with potential to follow-up via primary care where needed, reduced re-admission to hospital of over-65-year-olds by more than 40% (**S3.4**), whilst Holland and colleagues demonstrated that both Memory Specific Training (MEST) and life review could help to restore autobiographical memory, so reducing over-general memory and alleviating symptoms of both depression and anxiety (**S3.5**). Via systematic review, they also determined the absolute necessity of patient and carer inclusion in identification of needs and interventions to reduce refusal of key services (**S3.6**).

ARCHA Roles: Prof Helen Griffiths founded ARCHA in 2009. Dr Carol Holland became ARCHA director in 2016. Dr James Brown was ARCHA's first-appointed postdoctoral researcher, was promoted to Lecturer, Senior Lecturer and Associate Professor in 2013, 2016 and 2018 respectively and was appointed director of ARCHA in 2018.

3. References to the research

- S3.1** Rana, K.S., Arif, M., Hill, E.J., Aldred, S., Nagel, D.A., Nevill, A., Randeva, H.S., Bailey, C.J., Bellary, S. & **Brown, J.E.** (2014). Plasma irisin levels predict telomere length in healthy adults. *Age* **36**, 995-1001. <https://doi.org/10.1007/s11357-014-9620-9>
- S3.2** Pararasa, C., Ikwuobe, J., Shigdar, S., Boukouvalas, A., Nabney, I.T., **Brown, J.E.**, Devitt, A., Bailey, C.J., Bennett, S.J. & **Griffiths, H.R.** (2016). Age-associated changes in long-chain fatty acid profile during healthy aging promote pro-inflammatory monocyte polarization via PPAR γ . *Ageing Cell*, **15**, 128-139. <https://doi.org/10.1111/accel.12416>.
- S3.3** Torrão, R.C., Bennett, S.J., **Brown, J.E.**, and **Griffiths, H.R.** (2014). Does metabolic reprogramming underpin age-associated changes in T cell phenotype and function? *Free Radic. Biol. Med.* **71**, 26-35. <https://doi.org/10.1016/j.freeradbiomed.2014.03.002>.
- S3.4** Vernon, D., **Brown, J. E.**, Griffiths, E., Nevill, A. M. & Pinkney, M. (2019). Reducing readmission rates through a discharge follow-up service. *Future Healthcare Journal*, **6**, 114-117. <https://doi.org/10.7861/futurehosp.6-2-114>. D'Avanzo, B., Shaw, R., Riva, S.,
- S3.5** Leahy, F., Ridout, N., Mushtaq, F. and **Holland, C.** (2018). Improving specific autobiographical memory in older adults: impacts on mood, social problem solving, and functional limitations. *Ageing, Neuropsychology and Cognition* **25**(5), 695–723. <https://doi.org/10.1080/13825585.2017.1365815>
- S3.6** Avanzo, B.D., Shaw, R., Riva, S., Apostolo, J., Bobrowicz-Campos, E., Kurpas, D., Bujnowska, M. and **Holland, C.** (2017). Stakeholders' views and experiences of care and interventions for addressing frailty and pre-frailty: A meta-synthesis of qualitative evidence. *PLoS ONE* **12**(7), e0180127. <https://doi.org/10.1371/journal.pone.0180127>.

The quality of the research described above is evidenced by S3.1-S3.6, published in international, peer-reviewed journals; by the editorials commissioned from Brown for special issues of the journal *Biogerontology* (<https://doi.org/10.1007/s10522-016-9649-5> & <https://doi.org/10.1007/s10522-015-9556-1>) and the following competitively-awarded research grants: **BBSRC BB/G017832/1 £223,230**, Aston Research Centre for Healthy Ageing BBSRC studentships (2009-2013); **BBSRC BB/J500628/1 £91,932**, Epigenetic histone modifications in monocytes - a tractable link between metabolism, ageing and inflammation? (2011-2015); **BBSRC BB/M005054/1 £129,125**, Regulation of the fatty acid lipidome in ageing skin: a route towards novel anti-inflammatory products (2014-2016); **EU Innovative Medicines Initiative Grant Agreement No. 115621 €76,892**, Sarcopenia and physical frailty in older people: multi-component treatment strategies (SPRINTT, 2014-2020); **European Innovation Partnership on Active and Healthy Ageing Grant Agreement No. 664367 €1,427,779** Frailty management Optimisation through EIP AHA Commitments and Utilisation of Stakeholders input (FOCUS, 2015 – 2018).

4. Details of the impact

Context: ARCHA's research-based interaction with care homes started when Holland studied the effect on older adults of moving into an Extracare Charitable Trust retirement community. By 2015, she had demonstrated that Extracare's approach of integrated housing, care and support led to quantifiable reductions in NHS/social care costs at 12 months, plus a 10.1% improvement in residents' autobiographical memory and accompanying 14.8% reduction in depressive symptoms at 18 months (**S5.1**). Meanwhile, in 2017, TV company CPL productions Ltd. (CPL) chose to create a TV series examining the benefits of intergenerational care (regular interaction between nursery children and care-home residents). Importantly, CPL wished to substantiate their episodes with scientific evidence, rather than relying simply on anecdote.

Brown's established research expertise in biogerontology (**S3.1-S3.3**), wellbeing in older adults (**S3.4**) and ARCHA's past experience with care homes (**S5.1**) led CPL productions Ltd. to select Brown, as director of ARCHA, to design the series' scientific underpinning tests (a package of physiological and cognitive analyses) to quantify the effects of intergenerational activities on older adult volunteers (**S5.2**). Brown was teamed with clinicians experienced in intergenerational activities and an early-years expert, to conduct the study for Channel 4. Series 1 (2 episodes) was followed by a second series (5 episodes) based in the same Extracare village that Holland had studied previously. Brown consulted in both series, analysed the data, featured on-screen in series 2 and importantly, continued his research/engagement with participants after Series 2 completion. Brown's work with CPL, the resulting broadcast of *Old People's Home for 4 Year Olds* (OPHF4YO) and Brown's follow-up interactions with participants have led to:

Impact on Health and Wellbeing 1 - demonstrable improvements for older adults:

In series 2, Brown recorded statistically-significant improvements in balance, walking speed, grip strength, mood, overall cognitive function and episodic memory in older adult volunteers. His follow-up research found that these improvements were retained 6 months later and were also accompanied by outstanding improvements in residents' quality of life (**S5.3**). Qualitatively, a resident stated "*Personally, I improved in every one [test], sometimes spectacularly....I still find that I can converse freely and have lost the fear of starting up dialogues*" (this resident had described himself previously as "*almost a hermit*" **S5.3**).

Importantly, this impact was not limited to the care home/nursery featured in the TV series. The owner of Berrington Lodge Nursery (opened Sept-2018) wrote to Brown in December 2018, to say that OPHF4YO had inspired her to undertake similar intergenerational activities with a neighbouring care home (**S5.4**). Her recent update revealed that by mid-2019, their intergenerational activity had "*grown from strength to strength*". Describing multiple indoor and outdoor co-activities, she also described the two-way curiosity between generations and quoted a care home resident who stated "***This has switched my brain back on, I now have something to look forward [to] and think about***". With interactions currently curtailed to remote activities, the manager states: "*We can't wait for the time when we can visit the residents once more*" (**S5.4**).

Impact on Health and Wellbeing 2 - demonstrable improvements for nursery children:

Brown also worked closely with the early years expert who confirmed accompanying improvements in the children's behaviour, both quantitatively from test data and qualitatively from parents' observations. These confirmed that most children in OPHF4YO had improved confidence, language development, independence, imagination, maturity, empathy and concentration (**S5.5**). Qualitatively, a parent cites Brown's continued (post-series) engagement and states numerous benefits to her son, including *"It has opened up [son's] circle of friends. He refers to his favourite of the older adults ... when listing his friends – right alongside his 5-year-old friends from school. In his eyes there is no difference"* (**S5.5**). This change in perspective is again supported by Berrington Lodge's manager who states *"The strong bond we have with [care home] has reinforced their [children's] respect for the elderly"* (**S5.4**).

Impact on Culture and Society - the OPHF4YO legacy:

Numerous other UK care homes and nurseries cite OPHF4YO as their inspiration for commencing intergenerational activities (**S5.6**) whilst the Secretary of State for Health, the Rt Hon. Matt Hancock MP called for *"intergenerational care to become routine"* (**S5.7**). Intent has been followed by investment. United for All Ages (UAA) state *"intergenerational activities have exploded due to the two series of OPHF4YO"*. Working with Millenium Care, UAA are delivering a £12m intergenerational development program (**S5.8**). Meanwhile, OPHF4YO inspired ParkDean Resorts to commission research into intergenerational benefit and consequently, Brown consulted in developing the 'Great Grandparent Getaway' campaign. Despite the pandemic, ParkDean have now launched the UK's first four-generation holiday package (**S5.9**).

Impact on Commerce & Economy - international reputational & financial gains for CPL Productions Ltd. and Red Seven Entertainment:

Series 1 of OPHF4YO reached >2.5 million viewers per episode. Series 2 averaged 1.8 million viewers over 5 episodes, was 4th among human interest documentaries on Channel 4 and was a top-10 UK trending subject on Twitter in each week of broadcast. Multiple awards and a BAFTA nomination accorded to OPHF4YO benefitted CPL's reputation, culminating in their nomination for best Independent Production Company at the Broadcast Awards 2019 (**S5.10**). This high profile has also led to international sales: the format is now licensed to 15 countries over 3 continents, including Australia, New Zealand, Canada, and multiple European countries (**S5.10**) with associated financial gain.

5. Sources to corroborate the impact

- S5.1** The ExtraCare Charitable Trust: Better lives for older people. Brochure detailing key findings of ARCHA-based research into ExtraCare's integrated housing, health, plus press release: <https://www.extracare.org.uk/media/1168260/18239-brochure-210x210-166.pdf>.
- S5.2** Confidential letter from CPL productions Ltd. detailing the reasons for Dr Brown's selection and his contributions to the two OPHF4YO series.
- S5.3** Older adults anonymized test data (series 2 only) and letter from participant, detailing improvements in his quality of life that resulted from intergenerational activities featured in OPHF4YO.
- S5.4** Letter and update from Berrington Lodge Nursery re. introduction of intergenerational care inspired by OPHF4YO.
- S5.5** Influence of OPHF4YO in prompting new intergenerational activity. **Email** from United for All Ages (UAA) plus **news articles**:
National: 1. <https://www.carehomeprofessional.com/intergenerational-care-bridges-the-age-divide/>; 2. <https://www.theguardian.com/society/2018/nov/12/children-care-homes-residents-feel-more-human>; 3. <https://www.theguardian.com/society/2019/jan/05/children-elderly-intergenerational-care-advantages>;
Regional: **Belfast** <https://careindustrynews.co.uk/2019/03/belfast-care-home-opens-new-residential-dementia-suite/>; **Banbury** <https://www.banburyguardian.co.uk/news/mixing->

[children-elderly-sees-benefits-all-banbury-care-homes-124609](https://www.derbytelegraph.co.uk/burton/co-op-nursery-carden-bank-2350180); **Burton upon Trent** <https://www.derbytelegraph.co.uk/burton/co-op-nursery-carden-bank-2350180>; **Chulmleigh** <https://www.devonlive.com/news/local-news/toddlers-elderly-make-cross-generation-2638943>; **Falkirk** <https://www.falkirkherald.co.uk/news/people/falkirk-children-bring-immeasurable-christmas-joy-elderly-189440>; **Halstead** https://www.clactonandfrintongazette.co.uk/news/north_essex_news/17256771.halstead-nursery-set-open-care-home-next-year/; **Livingstone** <https://www.scottishhousingnews.com/article/bield-pensioners-prove-kidding-around-is-good-for-you>; **Rustington** <https://www.westsussex.gov.uk/news/extra-care-housing-welcomes-its-youngest-visitors-for-new-wellbeing-sessions/>; **St. Helens** <https://www.sthelensstar.co.uk/news/17210128.care-home-opens-doors-toddler>; **York** <https://www.yorkpress.co.uk/news/17004929.inside-yorks-old-peoples-home-4-year-olds/>; **West Yorkshire** <https://www.yorkshirepost.co.uk/news/bond-between-young-and-old-how-inter-generational-projects-are-making-difference-yorkshire-85269>; **Worthing** <https://www.worthingherald.co.uk/news/people/channel-4-programme-inspires-worthing-toddler-visits-care-home-229309>

- S5.6** Letters from OPHF4YO early years specialist and a parent, detailing improvements in children's behaviour resulting from intergenerational activities featured in OPHF4YO.
- S5.7** Press articles re. Matt Hancock's comments on intergenerational care, <https://www.thetimes.co.uk/article/care-for-toddlers-and-elderly-side-by-side-says-matt-hancock-health-secretary-dzltg92cg> and [Build nurseries in NHS hospitals to allow elderly to mix with toddlers, health secretary Matt Hancock says | The Independent | The Independent](https://www.independent.co.uk/news/health/build-nurseries-in-nhs-hospitals-to-allow-elderly-to-mix-with-toddlers-health-secretary-matt-hancock-says-the-independent-the-independent).
- S5.8** Activities in intergenerational care: Confidential letter from UAA detailing the influence that OPHF4YO has had on intergenerational care uptake and details of their investment / collaboration with Millennium Care: <https://www.nurseryworld.co.uk/news/article/ambitious-intergenerational-co-location-project-unveiled>
- S5.9** Confidential letter detailing the influence of OPHF4YO and Brown's direct contribution to development of specialist intergenerational holidays plus published details of their intergenerational holiday offering, "The Great Grandparent Getaway": <https://www.parkdeanresorts.co.uk/holidays/multi-generational/>.
- S5.10** OPHF4YO Statistics: viewer numbers, social media metrics, awards for OPHF4YO and international sales / options and related press releases (VOX).