NHS
Nottinghamshire Healthcare
NHS Foundation Trust

Cardiovascular Risk Profiles in Prisoners

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Making a Difference
Trust Honesty Respect Compassion Teamwork

Why is Cardiovascular disease important in Prison settings?

- In the general population CVD accounts for 25% (160,000) of all deaths each year

- 33% prison deaths are 'non–natural' (23% suicides, 10% drug O/D and rest)
- 67% of E and W prison deaths (371 in 2021) are natural cause and 98% are in men.
- of natural cause deaths, two-thirds are due to cardiovascular disease (PHE, 2014)
  - Deaths attract attention and investigation; therefore require extra resources

- The prevalence of CVD related illness are likely to rise due to the increasing age of prisoners (Over 50's increased from 7% to 16% from 2002 to 2022)

- CVD is potentially very preventable and treatable
  - healthcare contribution to saving lives around 40% v 10 % other conditions
- All prisoners should receive equitable health care (RCGP, 2018)

Existing Evidence – CVD in Prisons

- Little evidence on UK male prison population
  - High rate of CVD risk factors and secondary care CVD use in UK prisoners (Davies 2019)
- Greater evidence globally
  - In comparison to demographically-matched individuals in the community in US, those in prison had increased rates of CVD risk factors (especially hypertension – 30% vs 18%) (Maruschak 2015)
  - Hypertension, prevalence of smoking, physical inactivity, hypercholesterolemia are more prevalent among prisoners than the general population (Arrier 2013).
  - Risk factors for CVD worsen (maximally at 2 years incarceration) (Bondolfi 2020)
- UK women prisoner evidence
  - After 1 month of imprisonment CVD risk factors increased; poorer diet, increase in weight/BMI, less physical activity (Plugge 2009)

Background: NHS Health Check

- National E and W initiative:
  - started 2009. patchy uptake in prisons by 2014. Detailed prison guidance 2017.
- Designed to spot early signs of stroke, kidney disease, heart disease and type 2 diabetes
- Every 5 years
- For those who don't already have heart disease, kidney disease or diabetes
- Community – age 40-74
- Prison – age 35-74 and incarcerated for 2 or more years (criteria amended for prisons by PHE in 2017)
- NHS Health Checks should occur in each prison, but it was not clear who received them or whether those at high risk of CVD were being identified

Healthcheck Evidence Review 2020

- Evidence base mixed but benefits for more deprived patients appear stronger
- All forms of CVD morbidity are successfully detected
  - 1 in 10 have raised CVD risk
  - 1 in 30 hypertension
  - 1 in 80 diabetes
- Interventions arising from the Healthcheck variably taken up
- Attendees less likely to be smokers from all those eligible
- Overall, statin and antihypertensive prescribing increased

Uptake of Healthchecks

- General population
  - Attendance across 655 GPs in England was 30% in 2012 (Robson et al, 2015)
  - Current data for 2022 consistently 45-50% of those offered received a health check over the rolling 5-year period

- Prisons
  - Limited data regarding the uptake of Health Check in prisons. Almost no denominator information

Cardiovascular risk profiles and the uptake of the NHS Healthcheck Programme in male prisoners

Chris Packham, Marie Williams, Liz Butcher Adarsh Kaul: Notts Healthcare

Richard Morriss, Louise Thomson: University of Nottingham

Kamlesh Khunti, Joanne Miksza: University of Leicester

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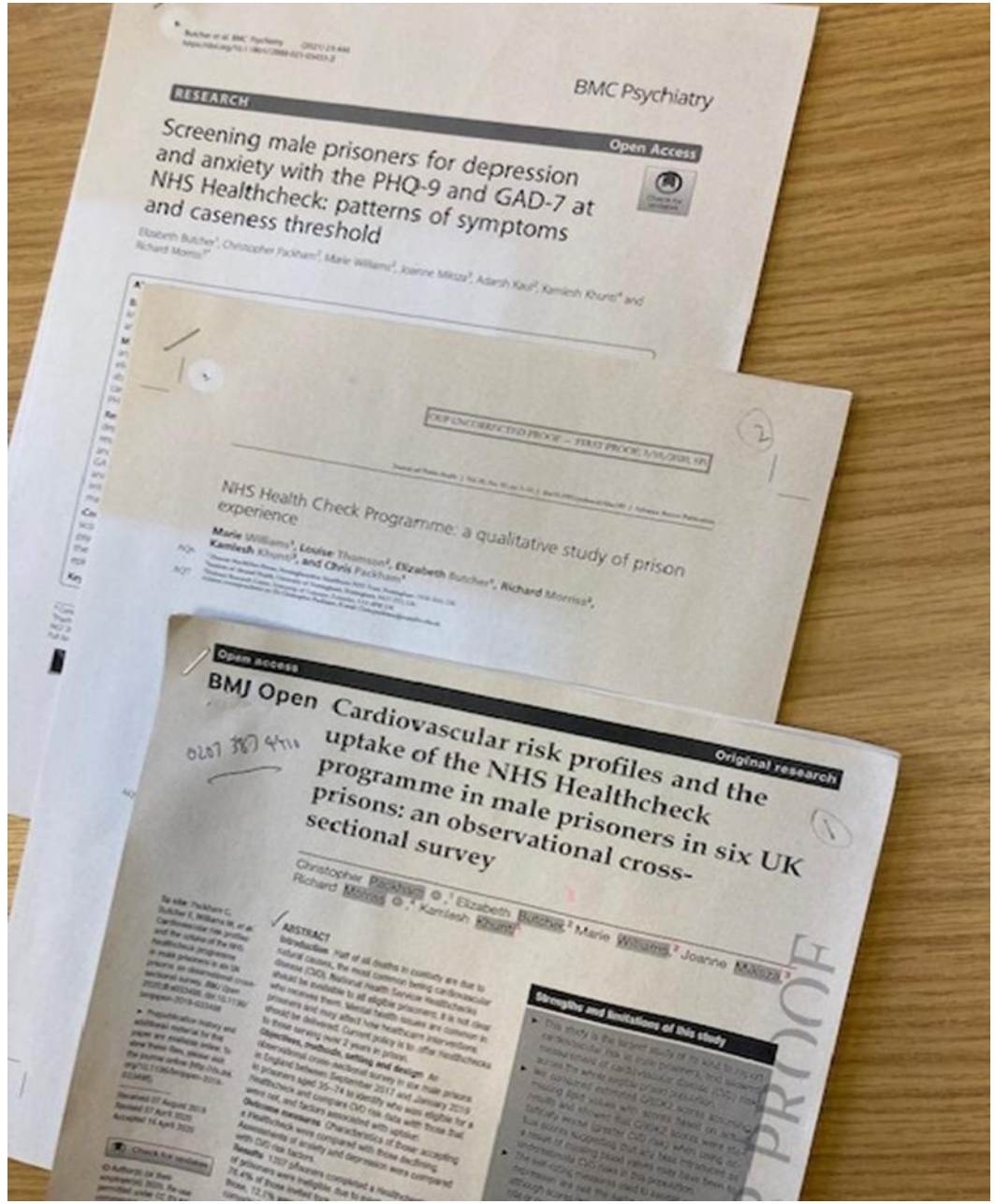


BMC Psychiatry

RESEARCH

Open Access

Screening male prisoners for depression and anxiety with the PHQ-9 and GAD-7 at NHS Healthcheck: patterns of symptoms and caseness threshold

NHS Health Check Programme: a qualitative study of prison experience

Open access

BMJ Open

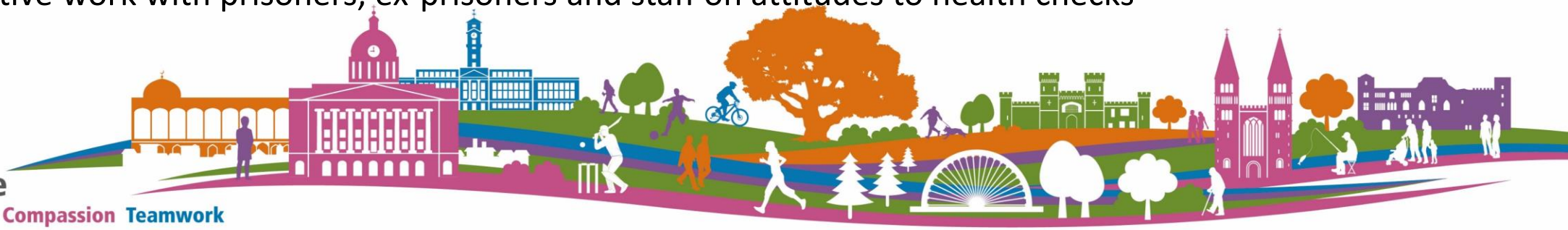
Original research

Cardiovascular risk profiles and the uptake of the NHS Healthcheck programme in male prisoners in six UK prisons: an observational cross-sectional survey

PROOF

Research Method

- 6 male prisons in the East Midlands
- Eligible population aged 35-74
  - Compared CVD risk data of those eligible with those who were not
  - Compared characteristics of those accepting a check with those declining
- Sample size required : 1200 participants
- Observational cross-sectional study 12 months 2017-2018
- The research ran alongside normal clinical practice (use of existing primary care teams)
- Adopted by CRN/NIHR
- Collected denominator data (all those eligible) and numerator data (those who consented and took up the offer)
- Collected NHS Health Check data and PHQ9 and GAD7 mental health assessments
- Qualitative work with prisoners, ex-prisoners and staff on attitudes to health checks



Who was eligible?

- A snap shot of eligibility in August 2018
  - Total aged 35-74 years = 2107. 78% eligible and 22% ineligible due to existing diagnoses
- Hence many CVD risks were significantly higher in the ineligible group
  - Age (54 vs 44 years)
  - Weight (94 vs 84kg)
  - BMI (31 vs 27)
  - Sentence length (2.0 vs 1.4 years)
  - QRISK2 score (13 vs 3)
- In community samples approximately 30% were ineligible (Robson, 2016) – likely due to higher age.

Who gets a Healthcheck?

- Whole population eligible (mean age 44) 3620
- Those eligible who were invited (44%) 1579
- Invited who agreed to a check (76%) 1207
- Odds of a black prisoner not receiving a healthcheck 2.7x that of a white prisoner

fewer black prisoners or smokers accepted. More with sentences > 2years

more black prisoners declined

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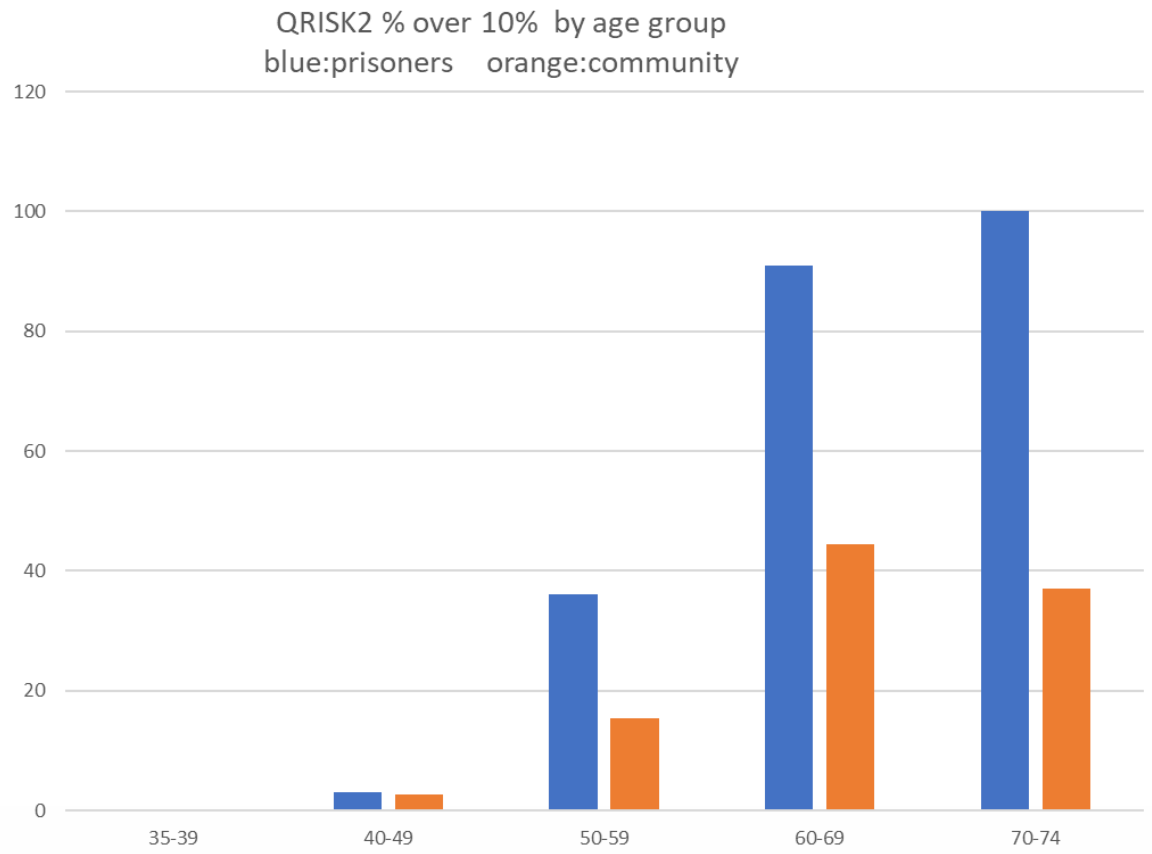
Received vs. Not received Healthcheck

- After LR adjustment, those who took up the health check differed from those who declined in ethnicity and prison site
- Ethnicity – higher percentage of black prisoners declined the health check (7.7% vs 3.4%)
- Prison – percentage of eligible prisoners having a health check varied from 65% to 93% across the 6 prisons

QRISK2 of eligible prisoners

- Scores above a 10% threshold varied across prison (between 5.4 to 19.8%)
  - Likely to be due to the age structure of the prison
- Overall 10.2% of prisoners had a QRISK2 score of 10% or more
- Community studies highlight higher number of males had a QRISK2 score of 10% or more (19%)
  - though this prisoner sample was almost 10 years younger on average.



Results from Healthcheck

- Among 1207 prisoners who received Health Check, 146 (12.1%) were found to have at least one of:
  - High CVD risk (high QRISK2 score)
  - Renal impairment
  - Diabetes/pre-diabetes
- Higher numbers still may exist but substantial values were missing due to absence of some blood tests in up to 30%
- Sentence length (comparing less or more than 2 years) did not show significant differences for diabetes or QRISK2 score

Mental Health of prisoners

- 37.6% of prisoners scored at or above the therapeutic threshold of 10 or more on PHQ9
- 31.4% were at or above the threshold of 10 on GAD7
- The more severe groups on both measures were younger
- Prisoners with sentence lengths of less than 2 years had higher scores on mental health assessments than longer serving prisoners
  - 41.1% vs 31.4% scoring moderate/severe on PHQ9
  - 34.9% vs 23.8% scoring moderate/severe on GAD7
- Prison category also impacts mental health scores
- Environmental factors may impact scoring on these measures

PHE (OHID) Policy

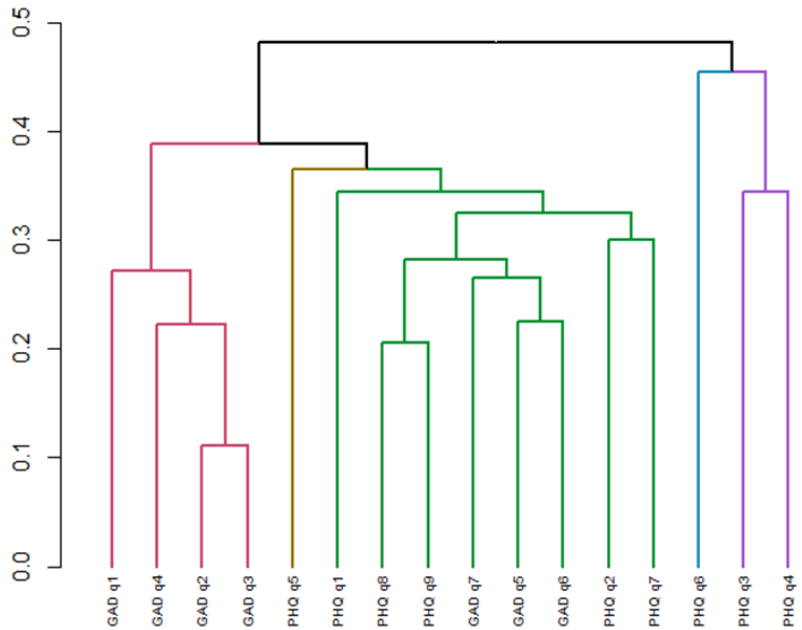
- Despite the 2 year incarceration criteria set by PHE there remains a substantial number of prisoners with adverse cardiovascular risk profiles under 2 years incarceration
- Only one prisoner under 40 had a qrisk2 score >10
- 10% of prisoners serving <2 years had a high QRISK2 score
- In addition, those with shorter sentences also had significantly higher levels of anxiety and depression
- Highlights a substantial unmet healthcare need if the current PHE policy remains.

Qualitative Themes

- Awareness and knowledge prior to health check (community/custody)
  - Misconceptions and expectations
  - Health Check Results
    - Interpreting results
    - No news is good news
    - Method of feedback
- Barriers
  - Accessibility
  - Waiting room
  - Feeling fine
  - Stigma/Fear
- Facilitators
  - Personal motivation to look after self in prison
  - Reassurance
  - Personal gain
- Increasing Uptake
  - Accessibility
  - Group based approaches
  - Reward
- Reducing risk of CVD
  - Restrictive regime
  - Motivation

Mental Health: Implications for PHQ-9 and GAD-7 assessment tools in prison settings

- Not all items in the PHQ-9 and GAD-7 are necessarily valid in prison settings
- Using a ‘dendrogram’ to group item correlations, cluster analysis showed a cluster with core symptoms of depression, slowness, restlessness, suicidality, poor concentration, irritability or fear.
  - Younger age, remand prisons, and previous high alcohol intake were particularly associated with this clustering
- Symptoms of altered appetite, poor sleep, lack of energy, and guilt or worthlessness fell into other clusters and may not be good indicators in these settings
- PHQ-9 and GAD-7 accepted thresholds may not be particularly robust in identifying possible ‘caseness’
  - PHQ-9 threshold of 10 may overdiagnose depression
  - GAD-7 threshold of 10 may detect anxiety more efficiently



Limitations

- Logistics of prison research – security, staffing clinic availability
- High throughput (between 15-100 prisoners per prison per month) – unable to invite all eligible prisoners (44% invited)
- Smoking status may be subject to error as both prisoners and healthcare staff interpreted their current status differently
- Missing values due to missing bloods
- Mental health measures were self-rated

Conclusions and take-home messages

- Largest European study to report CVD risk in male prisoners
- 22% of prison population aged 35-74 have existing CVD diagnoses
- 12% of prisoners who took part were found to have significant clinical risk for future CVD disease
  - Whole eligible population level likely to higher because of selection bias
  - Age-specific prevalence higher than general population
- Around one third had potentially important levels of anxiety or depression that required further exploration – this was commoner in shorter sentence prisoners (<2 years) but the tools used to identify caseness may need amending
- Health Inequality: A smaller proportion of eligible black or ethnic minority prisoners received a healthcheck
- Current policy
  - Of those prisoners serving less than 2 years (who do not receive healthcheck through current prison health care services), 10% had treatable levels of CVD risk
  - Screening those under 40 for CVD risk – minimal benefit
- Aftercare
  - Almost two-thirds of prisoners came from the most deprived areas of society – ensuing good access to primary care services is vital to achieving equity of care in this patient group following discharge
  - Hence seizing this intervention opportunity probably very important

Thank you

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