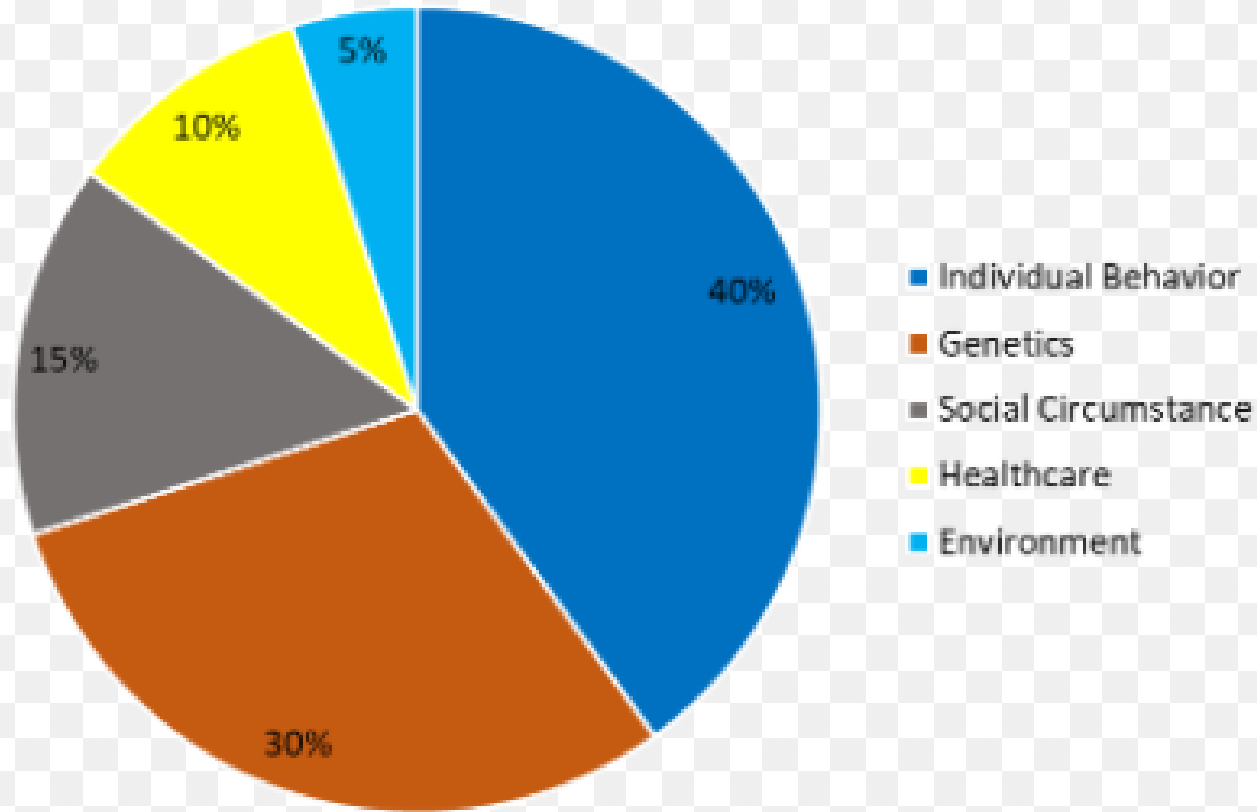


# Ávísun á hreyfingu - Hreyfiseðlar

Jón Steinar Jónsson

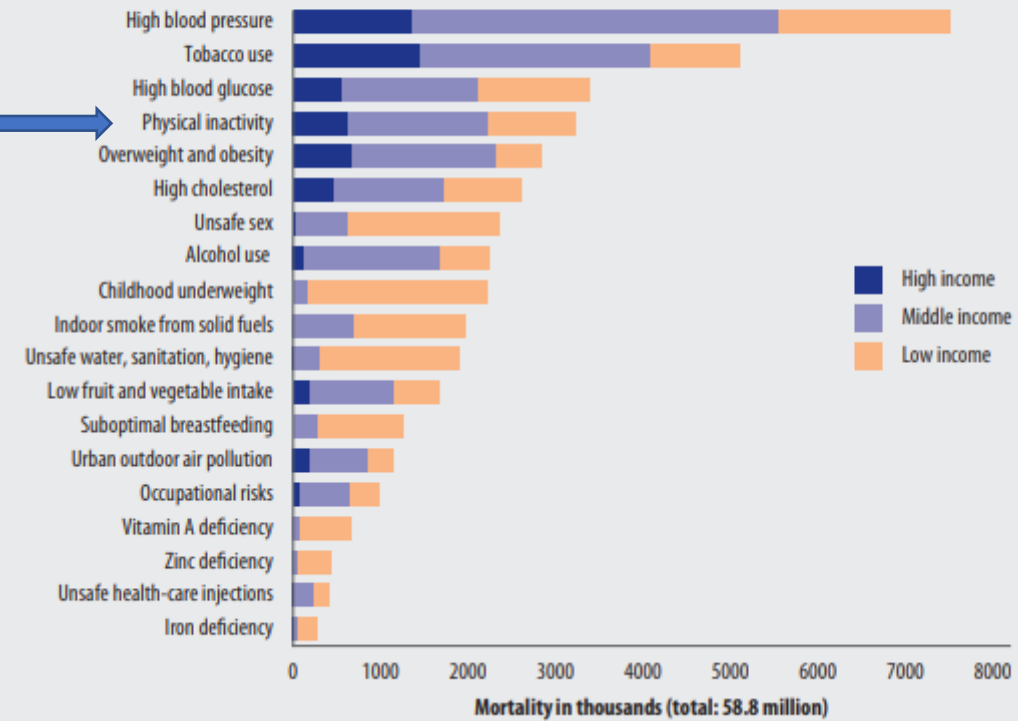


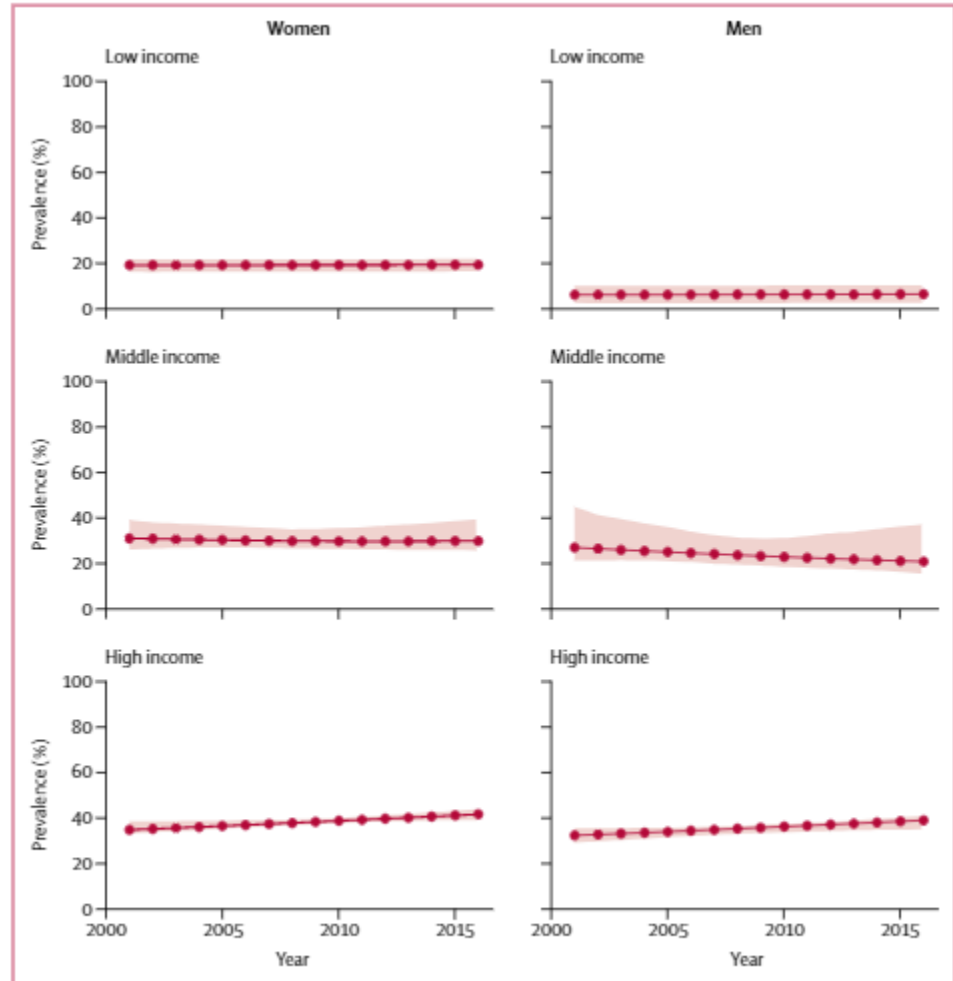
### Determinants of Health and Relative Impact on Overall Health



Source : <https://www.healthpolicyfellows.org/pdfs/WeCanDoBetter-SchroederNEJM.pdf>

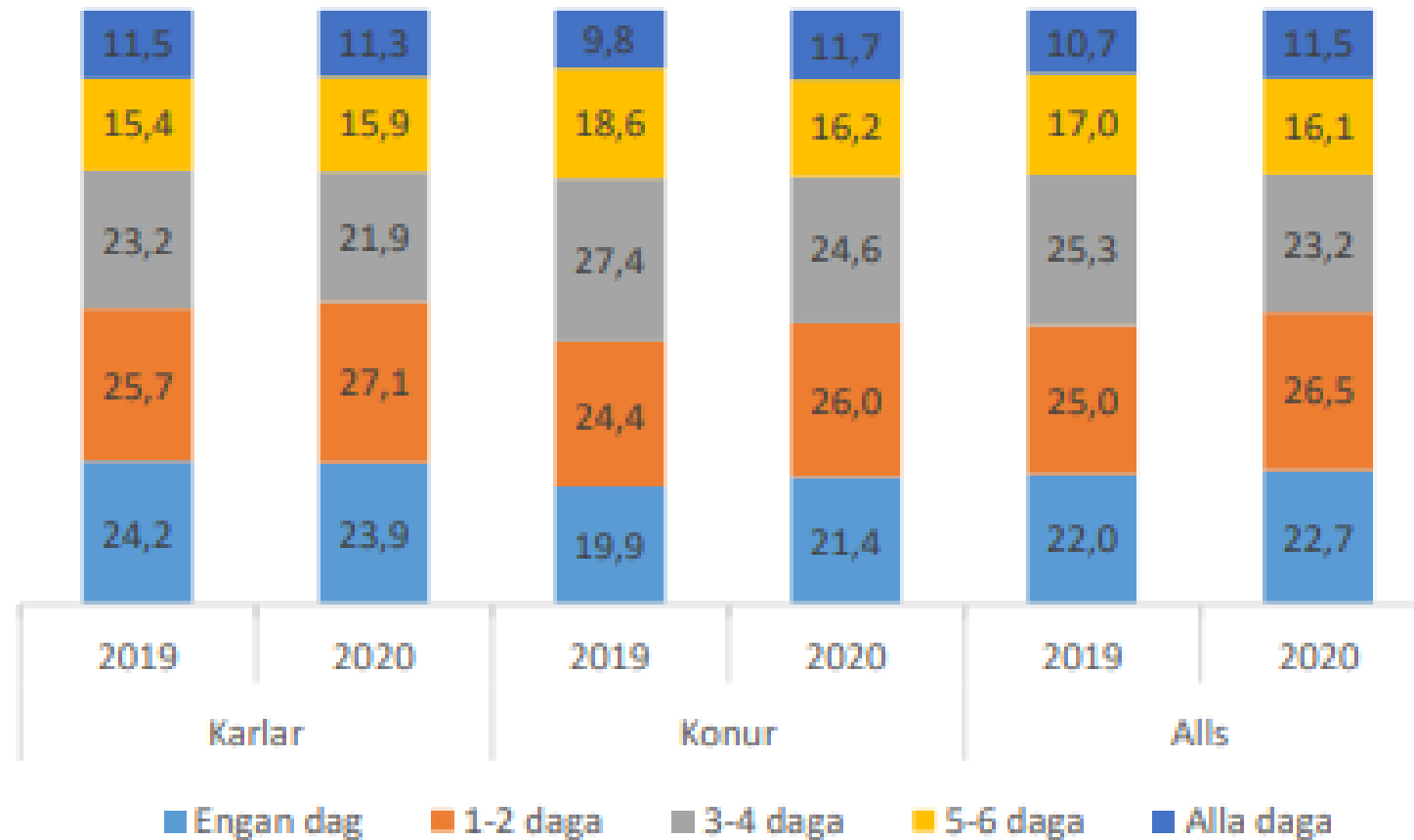
Figure 6: Deaths attributed to 19 leading risk factors, by country income level, 2004.





**Figure 3:** Trends in insufficient physical activity for three income groups from 2001 to 2016  
The shaded areas show 95% uncertainty intervals.

15. árgangur. 6. tölublað. Júní 2021



**Mynd 9.** Hlutfall fullorðinna eftir því hversu marga daga í viku röskleg hreyfing var stunduð í minnst 30 mínútur samtals á dag, greint eftir kyni, 2019 og 2020.

# BRITISH MEDICAL JOURNAL

LONDON SATURDAY DECEMBER 20 1958

## CORONARY HEART DISEASE AND PHYSICAL ACTIVITY OF WORK

EVIDENCE OF A NATIONAL NECROPSY SURVEY\*

BY

J. N. MORRIS, F.R.C.P., D.P.H.

AND

MARGARET D. CRAWFORD, M.D.

*Social Medicine Research Unit of the Medical Research Council, London Hospital*

It has previously been shown that the drivers of London's double-decker buses are more likely to die suddenly from "coronary thrombosis" than the conductors, and that Government clerks suffer more often from rapidly fatal cardiac infarction than do postmen.<sup>13</sup> On the basis of these and similar observations a hypothesis has been stated that *men in physically active jobs have a lower incidence of coronary (ischaemic) heart disease in middle-age than men in physically inactive jobs. More important, the disease is not so severe in physically active workers, tending to present in them in relatively benign forms.*

It is a principle of epidemiological research of this type to seek evidence from as many, as various, and as independent sources as possible.<sup>14</sup> The present report deals with the frequency, in relation to occupation, of ischaemic myocardial fibrosis in men dying from causes other than coronary heart disease itself. These myocardial scars are often evidence of early coronary heart disease and of less severe, or at any rate non-lethal, ischaemia. Thus the present study provides a picture of coronary heart disease in one of its simpler forms, and this may help in elucidating social connexions. At the same time another test of the hypothesis is made, using quite different data from the previous inquiries and upon quite another aspect of the condition. The inquiry it was hoped would provide some information on the pathological mechanisms of any differences with physical activity of work that were found; and in particular we sought to learn something about the relationships of occupation to coronary artery disease. In brief, Can the hearts of men be seen to vary with the kind of work they have done? At what phases in the complex of coronary-myocardial disease as a whole can this particular "cause"—physical activity/inactivity—be seen to operate? More generally the inquiry was intended to provide a statistical account of the coronary arteries of the middle-aged British male population, 1954-6.<sup>15</sup>

### Method

Through the universities and regional hospital boards we appealed personally to all pathologists in the National Health Service who might regularly be in

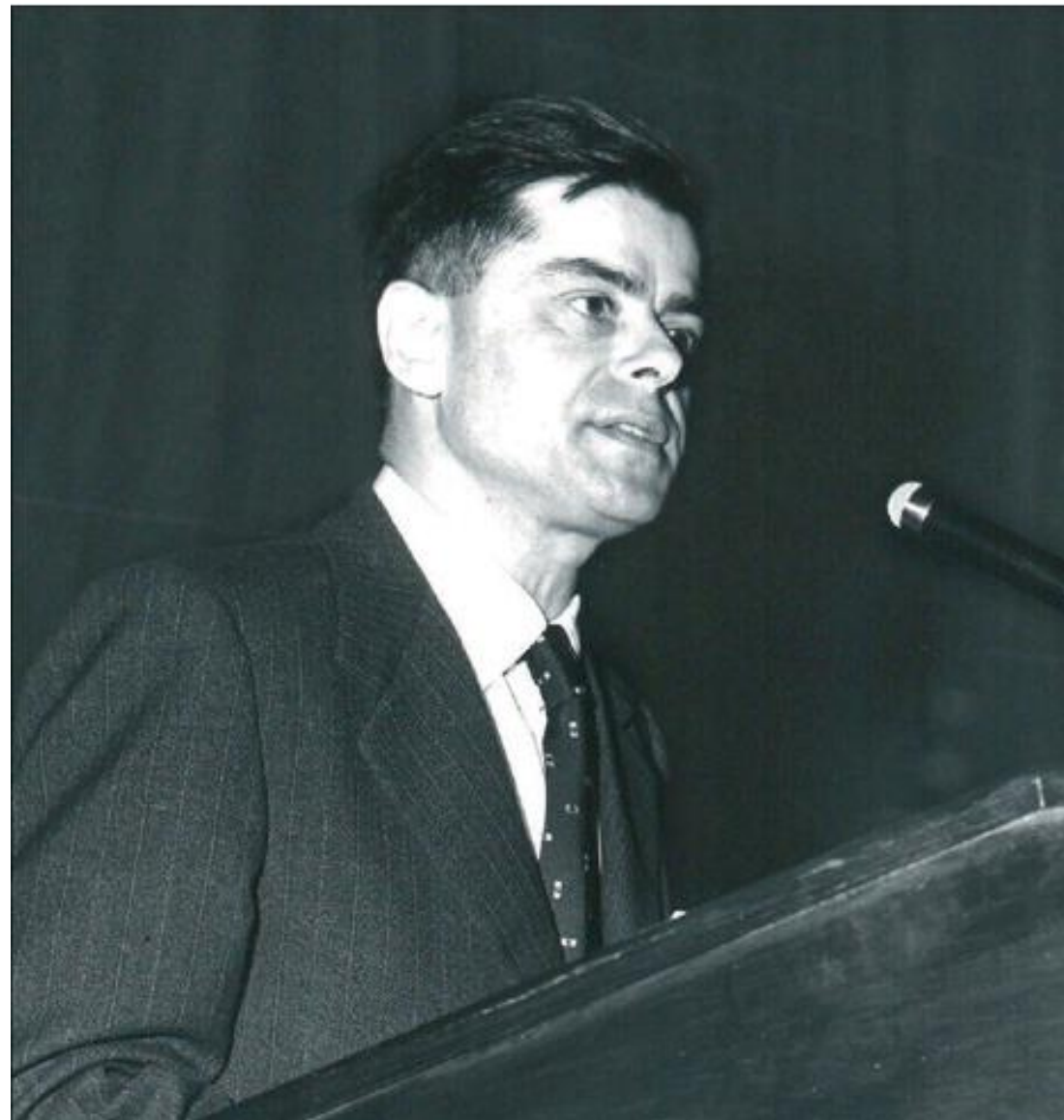
\*Part of this report was included in the Ernestine Henry Lecture delivered by one of us (J.N.M.) before the Royal College of Physicians of London on June 10, 1958.

charge of post-mortem examinations to co-operate in the inquiry, and the pathologists of 206 hospitals or hospital groups—between 85% and 90% of the "possibles"—very kindly agreed. We cannot be more precise about this fraction, because it is not known whether some of those who did not reply at all to our letters were in fact regularly responsible for appreciable numbers of necropsies.

Each pathologist was invited to provide particulars on a standard form of 25 consecutive unselected necropsies on men aged 45-70 years, no matter what the cause of death or how the case came to necropsy. 5,000 reports were sent to us: trial runs with records from 1944 to 1951 in the Pathological Institute of the London Hospital<sup>16, 17</sup> had encouraged the hope that with such numbers stable group patterns would emerge. In all cases *macroscopic details* were requested of *disease in the coronary arteries*, its nature, amount, and distribution, with descriptions of any stenosis; and of *fibrosis of the myocardium of the left ventricle and interventricular septum*, using lesions of 1 cm. in any dimension as markers; and the *heart weight*. Particulars were also asked about the main causes of death and other important clinical and pathological findings such as valvular heart disease, including especially aortic stenosis. By appealing for detailed descriptions of lesions seen, discouraging evaluations such as "slight" or "much," and giving guidance on terminology if not on technique, we hoped to reduce the variability of such procedures. It was postulated, moreover, that the variability in observation and recording over so many departments of pathology would be "random" in relation to the main factor with which pathology was to be correlated—physical activity of work.

The pathological data on each record relating to disease in the coronary arteries and fibrosis of the myocardium were graded, agreed, and coded by at least two and often three physicians in the unit. It took many months to define appropriate scales; but finally scales emerged that made pathological sense, were simple in use, having no more than five points, and the gradings on which proved highly reproducible by ourselves and by others.

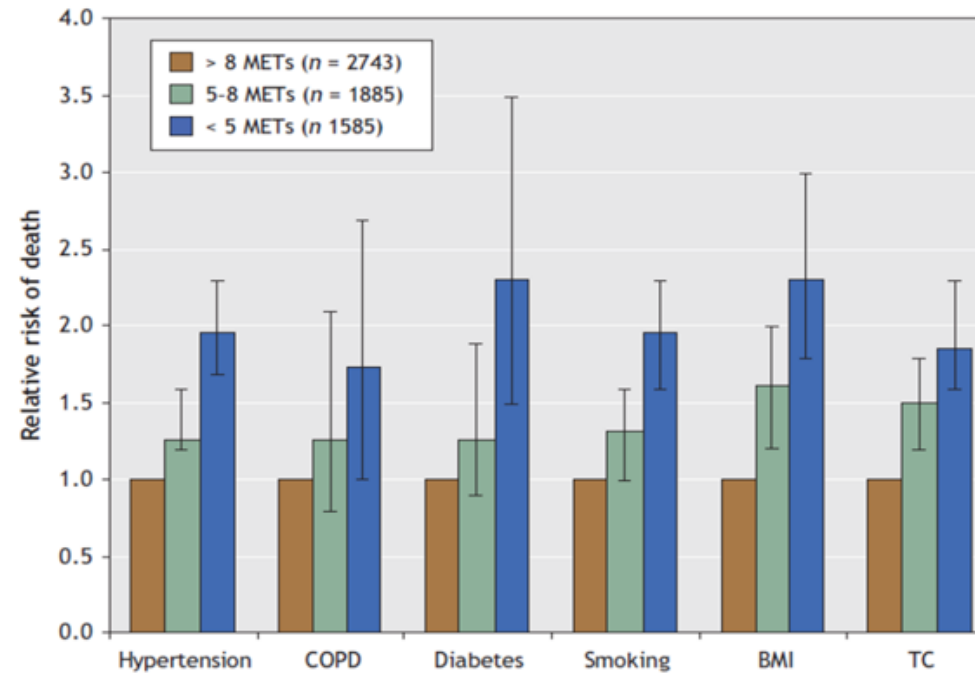
Pathologists were also invited to give details of the *last occupation* of the deceased, but in many cases this information had to be obtained by the unit from the



# Health benefits of physical activity: the evidence

CMAJ • MARCH 14, 2006 • 174(6)

Darren E.R. Warburton, Crystal Whitney Nicol, Shannon S.D. Bredin

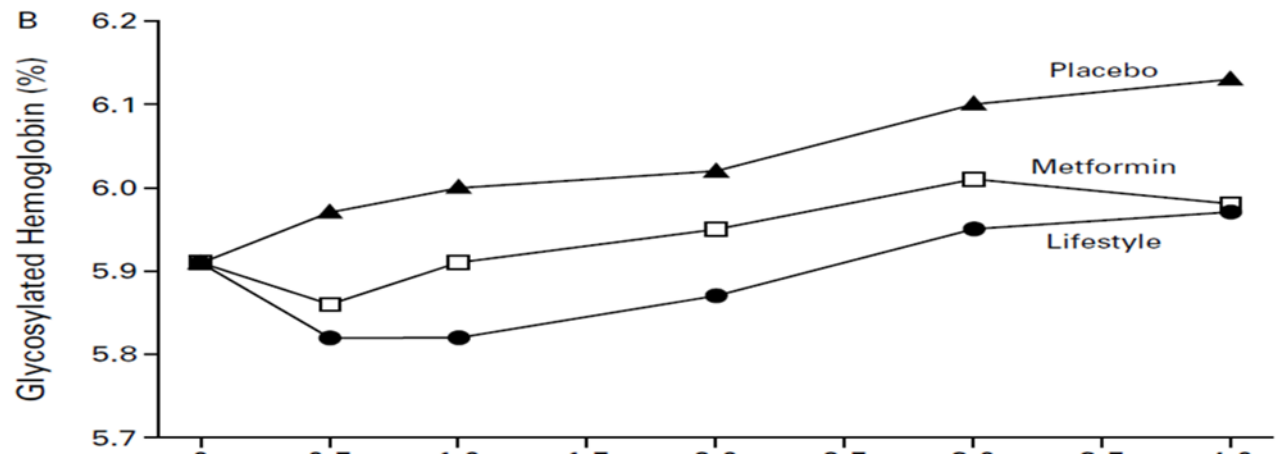
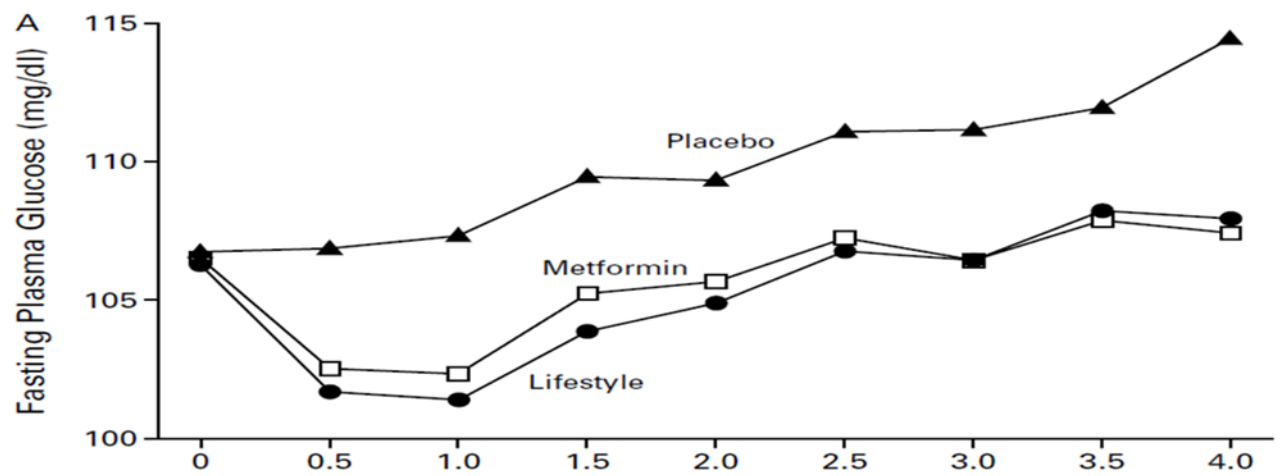


**Fig. 1:** Relative risks of death from any cause among participants with various risk factors (e.g., history of hypertension, chronic obstructive pulmonary disease [COPD], diabetes, smoking, elevated body mass index [BMI  $\geq 30$ ] and high total cholesterol level [TC  $\geq 5.70$  mmol/L] who achieved an exercise capacity of less than 5 METs (metabolic equivalents) or 5–8 METs, as compared with participants whose exercise capacity was more than 8 METs. Error bars represent 95% confidence intervals. Adapted, with permission, from Myers et al<sup>38</sup> (*N Engl J Med* 2002;346:793–801). Copyright © 2002 Massachusetts Medical Society. All rights reserved.

Healthy lifestyle and life expectancy free of cancer, cardiovascular disease, and type 2 diabetes: prospective cohort study







# FYSS 2017

Fysisk aktivitet i sjukdomsprevention  
och sjukdomsbehandling



Läkartidningen  
Förlag AB

Yrkesföreningar  
för fysisk aktivitet



# Hreyfing sem meðferð

- Sykursýki II
- Þunglyndi og kvíði
- Hár blóðþrýstingur
- Hjartasjúkdómar
- Offita
- Stoðkerfissjúkdómar
- Langvinn lungnateppa
- Beinþynning
- Krabbamein



Statens  
**folkhälso**institut

**FaR<sup>®</sup>**

Individanpassad skriftlig  
ordination av fysisk aktivitet

## Með tilliti til þeirra gagna sem fyrir liggja:

Med utgångspunkt från dessa resultat bör hälso- och sjukvårdspersonal använda två nivåer av insatser till patienter som behöver öka sin fysiska aktivitet i förebyggande och behandlande syfte:

- I. Till det stora flertalet erbjuds FaR, det vill säga patientcenterade samtal och en individanpassad skriftlig ordination av fysisk aktivitet som patienten bedriver på egen hand (vardagsaktivitet eller organiserad aktivitet).
- IIa. För de patienter som behöver utökat stöd för att komma i gång med fysisk aktivitet, erbjuds träningsgrupper inom vården som ett första steg.
- IIb. FaR kan därefter underlätta övergången från strukturerad träning inom vården, till att individen blir varaktigt fysiskt aktiv på egen hand.

4.

VETENSKAPLIGT STÖD FÖR FAR

Heilbrigðisstarfsmenn eiga að bjóða þeim sjúklingum sem þurfa að auka hreyfingu í fyrirbyggjandi skyni eða meðferðarskyni úrræði

I. Flestum ætti að bjóða hreyfiseðil

IIa Sumum þjálfun í hópum

IIb Markmiðið að íhlutunin endi með viðvarandi aukinni hreyfingu á eigin vegum

**HREYFISAGA**

## Sjúkraþjálfari á stöðinni kynnir hreyfiseðil fyrir kandidat

Ágæti læknakandidat

Um leið og við bjóðum þig velkominn í starfsnám í heilsugæslunni viljum við minna á hreyfiseðilinn.

Læknar í heilsugæslunni geta ávísað hreyfingu sem meðferð, kallað hreyfiseðill. Við viljum hvetja þig til að kynna þér rit sem heitir FYSS (fysisk aktivitet I sjukdomsprevention och sjukdomsbehandling) og er á netinu fyss.se. Þar er að finna ítarlegar upplýsingar um hreyfingu sem fyrirbyggjandi úrræði og sem meðferð við allmörgum sjúkdómum. Um er að ræða algenga sjúkdóma eins og fullorðinssykursýki, háþrýsting, vægt þunglyndi, offitu, langvinna verki, beinþynningu, langvinna lungnateppu, astma osfrv.

Teljir þú ábendingu fyrir hreyfingu sem meðferð eða hluta af meðferð hjá sjúklingi getur þú ávísað hreyfiseðli.

Þú þarft að fylla út hreyfiseðilseyðublað (í bréfaflipa Sögu) og skrá sjúkling í viðtal hjá sjúkraþjálfara (hreyfistjóra) í bókunarkerfinu. Sjúkraþjálfarinn (hreyfistjórinn), sem er reyndur á sínu sviði með þekkingu á áhugahvetjandi samtölum á 1 klst viðtal við sjúkling, gerir mat á hans stöðu m.a. með 6 mín gönguprófi. Sjúkraþjálfarinn og sjúklingurinn leggja síðan upp plan um hreyfingu skv forskrift FYSS og miðað við getu og vilja viðkomandi. Sjúklingur skráir hreyfinguna í hreyfiseðilseiningu í Heilsuveru og sjúkraþjálfarinn fylgist með frammistöðu hans og hefur samband eftir þörfum, hvetur og lagar prógrammið eftir þörfum. Tilvísandi læknir getur fylgst með í hreyfistjórnareiningu í Sögu og fær skýrslu um gang mála á 3 mán fresti og við útskrift úr hreyfiseðli.

Við hvetjum þig til að nýta þér þetta meðferðarúrræði og hvetjum þig til að hafa samband við undirritaðan ef einhverjar spurningar vakna.

# Hreyfiseðill

- Eyðublað í bréfaflipa Sögu
- Skrá í viðtal hjá sjúkraþjálfara
- Viðtal við sjúkraþjálfara
- Áætlun
- Skráning hreyfingar í heilsuveru
- Eftirfylgd sjúkraþjálfara og hvatning
- Skýrsla til tilvísanda



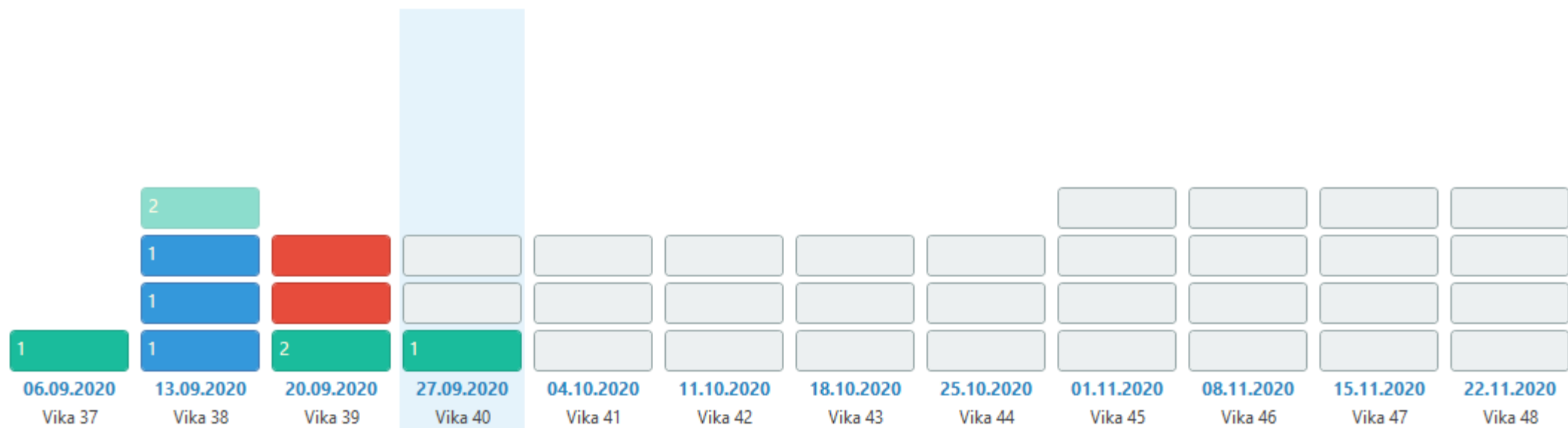
<b>Hreyfiseðill</b> Almennar lyflækningar			
<b>Persónuupplýsingar</b>			
Nafn	Sími	Kennitala	
Jóna Jónsdóttir		010170-5599	
Heimili	Farsími	Vinnusími	
Borgartún 37, 105 Reykjavík			
Starf	Netfang		
<b>Ábendingar fyrir hreyfiseðli</b>			
#1	Heiti	Kóði	
	Brot á framristarbeiðni	S92.3	
<b>Aðrar sjúkdómsgreiningar</b>			
#1	Heiti	Kóði	
	Mæði	R06.0	
<b>Lyf</b>			
#1	Heiti	Kóði	Styrkur
	Ibuxín	M01AE01	600 mg
			Ta / Mo
			Sk / Há
			Slóðegi
			Kvöld
<b>Rannsóknaniðurstöður</b>			
<b>Sjúkrasaga og skoðun</b>			
<b>Atriði sem kalla á varúð hjá þjálfara</b>			
<b>Endurkoma</b>			
Endurkoma:			
Sjúklingur á að bóka endurkomutíma eftir:			
<input type="radio"/>	1 mánuð	<input checked="" type="radio"/>	3 mánuð
<input type="radio"/>	2 mánuð	<input type="radio"/>	6 mánuð
<input type="radio"/>		<input type="radio"/>	9 mánuð
<input type="radio"/>		<input type="radio"/>	12 mánuð
<b>Undirskrift</b>			
Númer	Starfsmaður	Starfsheiti	Útfyllt af
1932	Hjörtur Sturluson	Tunnutækni	Hjörtur
Aðsetur			
Saga_skema -TMS - Theriak, S-Álma, 545-3300			
Dags.	Undirskrift		
21.05.2014			



- Sjúklingar
- AFGREIÐSLA
  - FORSÍÐA STARFSMA
  - FORSÍÐA SJÚKLINGS
  - EYÐUBLÖÐ
  - Lyfjakort WPF
  - Lyfjakort
  - Heilsugátt
  - TEXTASÝN WPF
  - Gagnagátt Sí
  - Textasýn
  - MÆDRASKRÁ
  - Ungbarnavernd
  - Vaxtarlínurit PcPAL
  - Ónæmisáðgerðir
  - Hreyfistjórnun
  - Mælingar
  - Yfirlit stofnunar
  - Viðhengi
  - Vinnulisti
  - Heilsuvandar
  - Rannsóknir
  - Pappírssjúkraskrá
  - Bólusetning ferðaman
  - SÉRLYFJASKRÁ
  - SKAFL
  - UpToDate

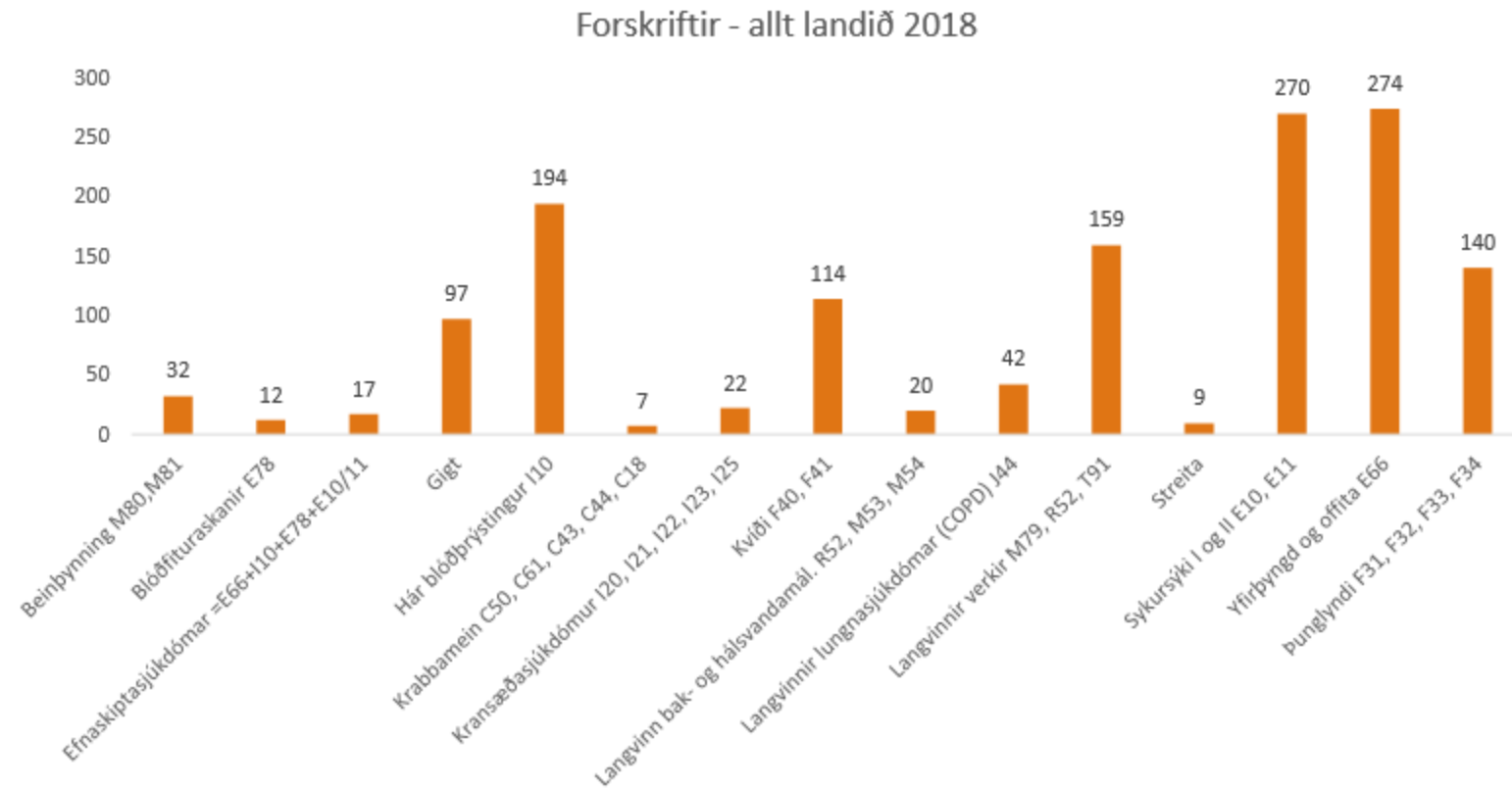


Áætlun 11.09.2020



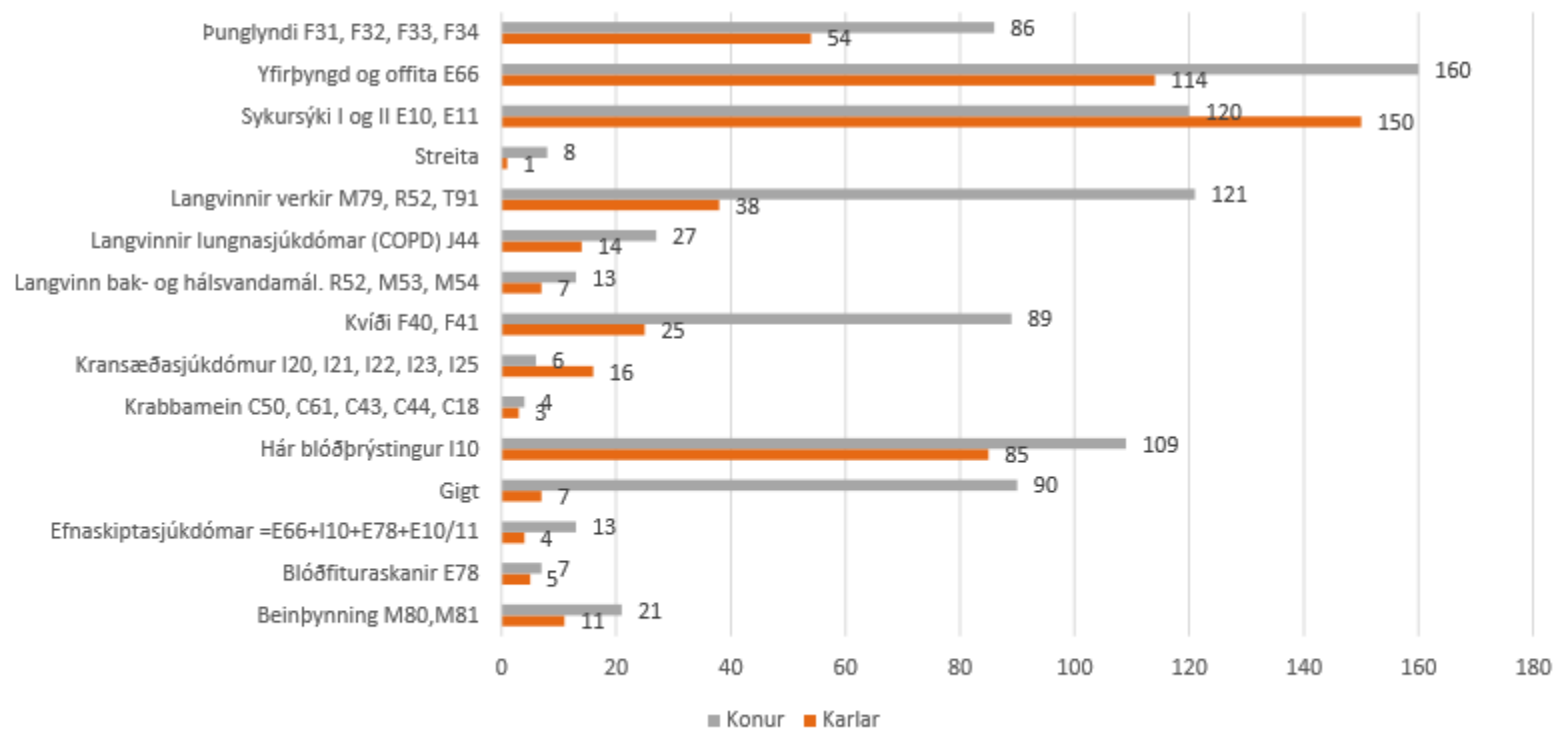
- 1 - Hreyfistjóri skráði hreyfingu.
- 1 - Hreyfistjóri skráði hreyfingu og er þetta hreyfing sem var aukadagur miðað við það sem áætlað var.
- Engin hreyfing skráð.
- 2 - Einstaklingur skráði hreyfingu og hreyfði sig tvisvar sama daginn.
- 1 - Einstaklingur skráir sjálfur og hreyfir sig aukalega einn dag miðað við áætlun.
- Ekki hefur verið skráð hreyfing, þ.e. vika er ekki útrunnin og er eftir að skrá hreyfingu á dag.

# Forskriftir – allt landið 2018

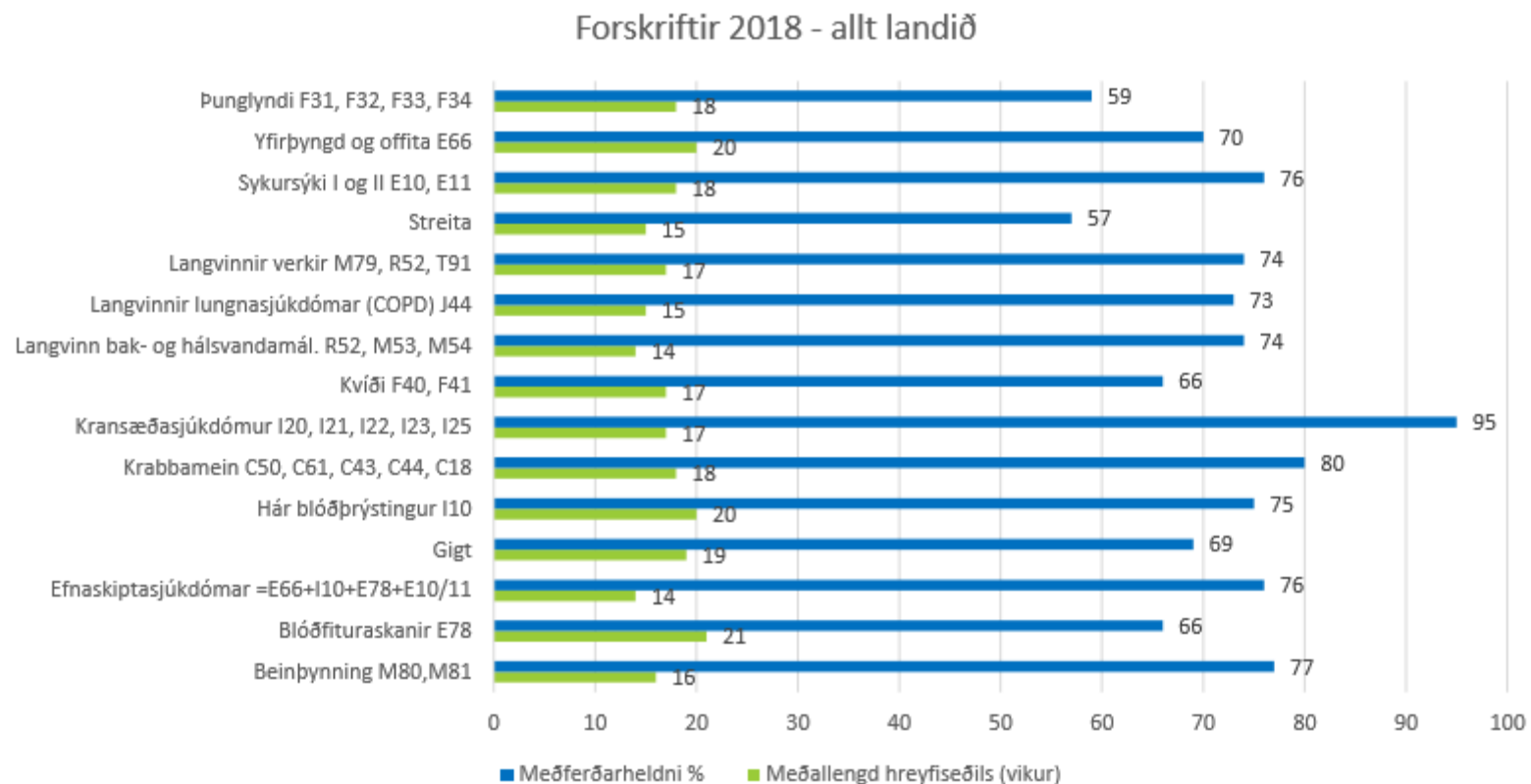


# Forskriftir 2018 - kynjaskipting

Forskriftir hreyfiseðla 2018, kynjaskipting - allt landið



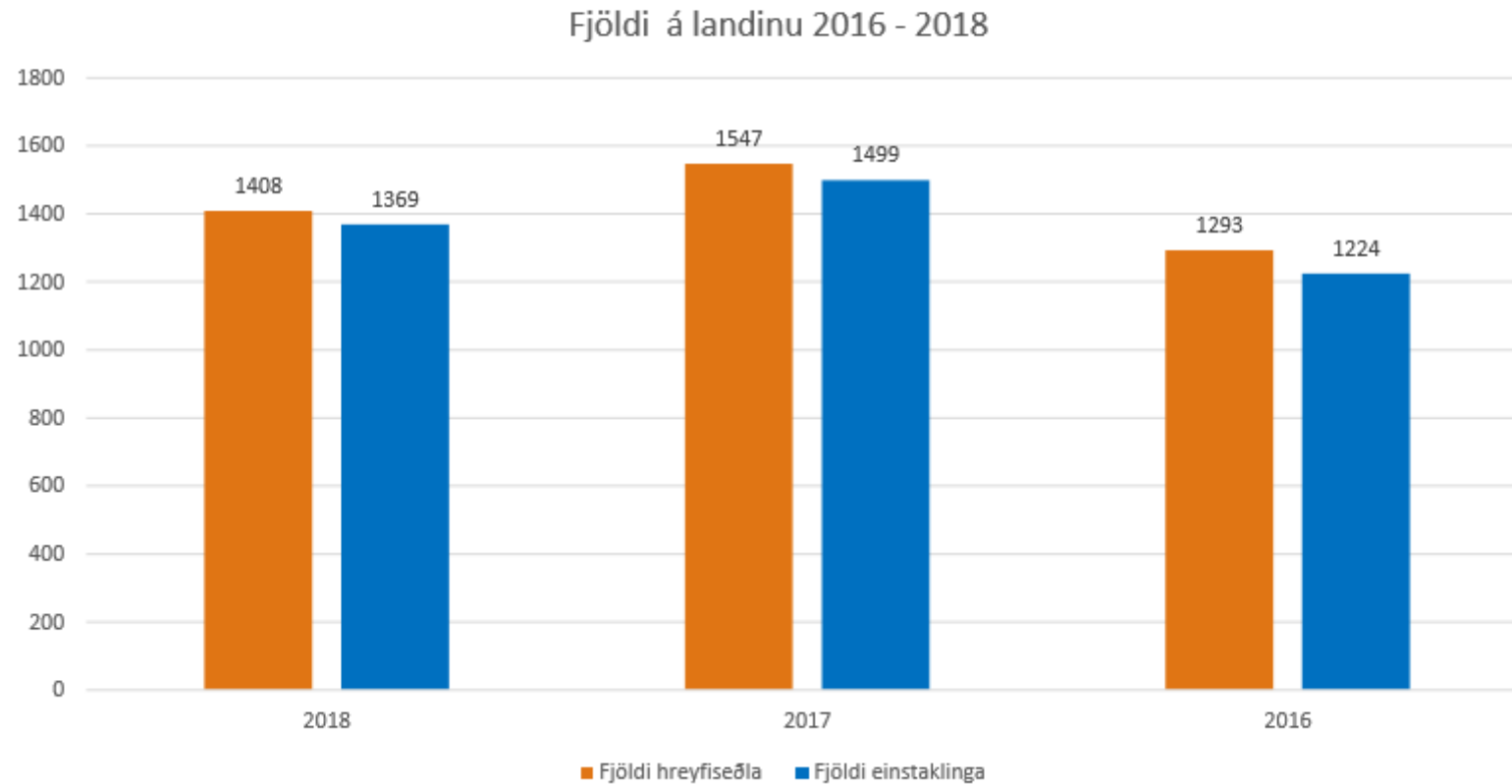
# Forskriftir eftir meðferðarhældni og lengd hreyfiseðils 2018 – allt landið



# Meðalaldur einstaklinga 2018 út frá forskriftum – allt landið



# Fjöldi á landinu öllu 2016 - 2018





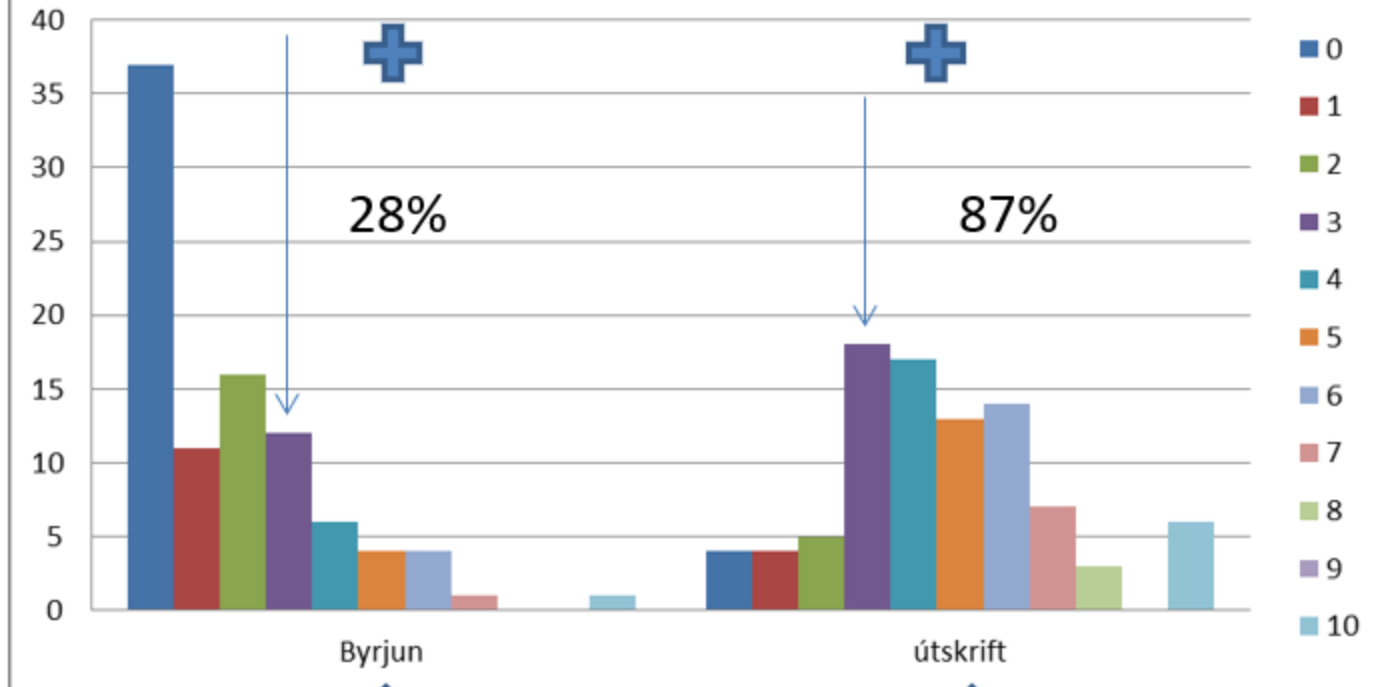
# Hreyfiseðlar á öllum stofnunum 2020

Heilbrigðisumdæmi	Fjöldi einstaklinga	Fjöldi per 1000 manns útgefið	Fjöldi per 1000 manns með áætlun
Vesturland	17.330	2,1	1,8
Vestfirðir	5.777	5,4	3,6
Norðurland	35.488	4,8	3,7
Austurland	10.207	4,0	3,3
Suðurland	28.415	2,4	1,8
Suðurnes	24.059	2,1	1,0
Höfuðborgarsvæðið	234.877	4,5	3,1
	356.153		

# Hreyfiseðlar á höfuðborgarsvæðinu 2020

Námar:	Höfuðborgarsvæðið	Fjöldi einstaklinga	Fjöldi per 1000 manns útgefið	Fjöldi per 1000 manns með áætlun
	Heilsugæslan Árbæ	14.704	4,8	2,7
	Heilsugæslan Efra-Breiðholti	10.111	5,3	4,4
	Heilsugæslan Efstaleiti	9.798	6,1	5,0
	Heilsugæslan Fjörður	12.136	2,1	1,5
	Heilsugæslan Garðabæ	12.946	4,7	4,0
	Heilsugæslan Glæsibæ	8.877	5,9	5,0
	Heilsugæslan Grafarvogi	11.237	2,8	2,8
	Heilsugæslan Hamraborg	10.790	1,9	1,2
	Heilsugæslan Hlíðum	11.575	7,5	5,1
	Heilsugæslan Hvammí	9.216	2,0	1,3
	Heilsugæslan Miðbæ	13.351	4,0	3,0
	Heilsugæslan Mjódd	9.292	3,2	2,2
	Heilsugæslan Mosfellsumdæmi	9.856	6,2	4,1
	Heilsugæslan Seltjarnarnesi	16.417	8,5	5,5
	Heilsugæslan Sólvangi	17.554	4,8	3,5
	Heilsugæslan Salahverfi	15.505	0,6	0,6
	Heilsugæslan Höfða	20.573	4,8	2,2
	Heilsugæslan Urðarhvarfi	8.120	1,6	1,1
	Heilsugæslan Lágmúla	12.819	6,6	4,4
		<b>234.877</b>		

## Virknir hreyfiseðilsjúklinga



Byrjun

útskrift

10%



43%



28%

87%

# Langtíma áhrif hreyfiseðils á virkni á SAK

Fjölirnir Guðmannsson, Ósk Jórunn Árnadóttir, Jón Torfi Halldórsson

- 86 einstaklingar
- Virknispurningar
  - 2,1 í byrjun (86)
  - 5,3 við útskrift (86)
  - 4,0 eftir 6 mánuði (86)
  - 4,5 eftir 12 mánuði (43)
  - 4,3 eftir 18 mánuði (10)

# Physical activity prescription: a critical opportunity to address a modifiable risk factor for the prevention and management of chronic disease: a position statement by the Canadian Academy of Sport and Exercise Medicine

Jane S Thornton,<sup>1</sup> Pierre Frémont,<sup>2</sup> Karim Khan,<sup>3</sup> Paul Poirier,<sup>4</sup> Jonathon Fowles,<sup>5</sup> Greg D Wells,<sup>6</sup> Renata J Frankovich<sup>7</sup>

**Author note** This position statement has been endorsed by the following nine sport medicine societies: Australasian College of Sports and Exercise Physicians (ACSEP), American Medical Society for Sports Medicine (AMSSM), British Association of Sports and Exercise Medicine (BASEM), European College of Sport & Exercise Physicians (ECOSEP), Norsk forening for idrettsmedisin og fysisk aktivitet (NIMF), South African Sports Medicine Association (SASMA), Schweizerische Gesellschaft für Sportmedizin/Swiss Society of Sports Medicine (SGSM/SSSM), Sport Doctors Australia (SDrA), Swedish Society of Exercise and Sports Medicine (SFAIM), and CASEM.

## ABSTRACT

Non-communicable disease is a leading threat to global health. Physical inactivity is a large contributor to this problem; in fact, the WHO ranks it as the fourth leading risk factor for overall morbidity and mortality worldwide. In Canada, at least 4 of 5 adults do not meet the Canadian Physical Activity Guidelines of 150 min of moderate-to-vigorous physical activity per week.

Physicians play an important role in the dissemination of physical activity (PA) recommendations to a broad segment of the population, as over 80% of Canadians visit their doctors every year and prefer to get health information directly from them. Unfortunately, most physicians do not regularly assess or prescribe PA as part of routine care, and even when discussed, few provide specific recommendations. PA prescription has the potential to be an important therapeutic agent for all ages in primary, secondary and tertiary prevention of chronic disease. Sport and exercise medicine (SEM) physicians are particularly well suited for this role and should collaborate with their primary care colleagues for optimal patient care. The purpose of this Canadian Academy and Sport and Exercise Medicine position statement is to provide an evidence-based, best practices summary to better equip SEM and primary care physicians to prescribe PA and exercise, specifically for the prevention and management of non-communicable disease. This will be achieved by addressing common questions and perceived barriers in the field.

Prescription of physical activity (PA) is a key element of the multifaceted societal approach needed to address inactivity.<sup>4-5</sup> Substantial evidence exists to support the benefits of exercise on at least 30 chronic diseases<sup>6-10</sup> as well as the cost-effectiveness of exercise prescription in primary care,<sup>11-12</sup> even for cardiovascular (CV) disease alone.<sup>13</sup>

Physicians play an important role in the dissemination of PA recommendations to a broad segment of the population. Over 80% of Canadians visit their doctors every year and prefer to get health information directly from their family physician.<sup>14-15</sup> Unfortunately, most physicians do not regularly assess or prescribe PA as a part of routine care,<sup>16-18</sup> and even when discussed, few provide specific recommendations.<sup>19</sup>

PA prescription has the potential to be an important therapeutic agent for all ages in primary, secondary and tertiary prevention of chronic disease. Sport and exercise medicine (SEM) physicians are particularly well suited for this role and should collaborate with their primary care colleagues for optimal patient care. We must act now to correct the general lack of knowledge and training in our medical schools and residency programmes surrounding PA guidelines and prescription<sup>20-23</sup> as well. The purpose of this Canadian Academy and

Physical inactivity is and will remain one of the gravest threats to public health for this and future generations of Canadians unless a catalyst for change can be found. With a simple prescription for PA, front-line physicians have one more tool to bring about real change in the lives of Canadians. With the evidence summarised in this review, the message is clear that PA prescription works and costs less than relying on the alternatives alone. The time to act is now.

Western University, London, Ontario, Canada  
Dip Sport Med (CASEM), Laval University, Ville de Québec, Québec, Canada  
University of British Columbia, Vancouver, British Columbia, Canada  
Institut Universitaire de Cardiologie et de Pneumologie de Québec and Faculty of Pharmacy, Laval University, Québec, Canada  
Acadia University, Wolfville, Nova Scotia, Canada  
Hospital for Sick Children, University of Toronto, Toronto, Ontario, Canada  
Dip. Sport Med (CASEM), University of Ottawa, Ontario, Canada

**Correspondence to**  
Dr Jane S Thornton, Western University, 10 Harrison Crescent, London, Ontario, Canada N5Y 2V4; jane.s.thornton@gmail.com

Accepted 3 June 2016  
Published Online First 22 June 2016

The results of the present systematic review have important clinical implications. We suggest that PAP models containing the core elements of the Swedish PAP model may be considered for implementation in routine healthcare to increase the PA levels of patients in need of increased PA. However, it remains to be elucidated which components of Swedish PAP plausibly are responsible for the positive effects on PA levels. Furthermore, long-term effects and effects on hard-end points need further study. We recommend that future studies focus on using well-validated methods for measuring level of PA and include long-term follow-ups. We also recommend that future studies investigate the individual effect of each core element of the Swedish PAP model.

## Physical activity on prescription in accordance with the Swedish model increases physical activity: a systematic review

Aron Onerup,<sup>1</sup> Daniel Arvidsson,<sup>2</sup> Åse Blomqvist,<sup>3</sup> Eva-Lotte Daxberg,<sup>4</sup> Lennart Jivegård,<sup>5</sup> Ingibjörg H Jonsdottir,<sup>6</sup> Stefan Lundqvist,<sup>3</sup> Anders Mellén,<sup>7</sup> Josefine Persson,<sup>8</sup> Petteri Sjögren,<sup>5</sup> Therese Svanberg,<sup>9</sup> Mats Borjesson<sup>2,10</sup>

### ABSTRACT

**Objectives** This study investigates the effects of the core elements of the Swedish model for physical activity on prescription (PAP) by evaluating studies that compared adults who received PAP with adults who did not receive PAP. All participants were adults identified by a healthcare professional as in need of increased physical activity. Primary outcome was level of physical activity.

**Design** Systematic review.

**Eligibility criteria** (1) Published 1999. (2) Systematic review, randomised controlled trial (RCT), non-RCT or case series (for adverse events). (3)  $\geq 12$  weeks' follow-up. (4) Performed in the Nordic countries. (5) Presented in English, Swedish, Norwegian or Danish.

**Data sources** Systematic searches in PubMed, Embase, the Cochrane Library, AMED, CINAHL and SweMed+ in September 2017. Included articles were evaluated using checklists to determine risk of bias.

**Results** Nine relevant articles were included: seven RCTs, one cohort study and one case series. Primary outcome was reported in seven articles from six studies (five RCTs, one cohort study, 642 participants). Positive results were reported from three of the five RCTs and from the cohort study. No study reported any negative results. Swedish PAP probably results in an increased level of physical activity (GRADE $\oplus\oplus\oplus\oplus$ ).

**Conclusions** Although the number of the reviewed articles was relatively modest, this systematic review shows that PAP in accordance with the Swedish model probably increases the level of physical activity. As a model for exercise prescription, Swedish PAP may be considered as part of regular healthcare to increase physical activity in patients.

### What is already known

- Physical inactivity is the fourth leading cause of non-communicable disease worldwide according to the WHO.
- A large part of the population in industrialised countries, including the population in contact with healthcare, is insufficiently physically active.
- Methods to increase the level of physical activity in patients have shown mixed results in previous systematic reviews and therefore new methods are needed.

### What are the new findings

- The present systematic review shows that the Swedish physical activity on prescription (PAP) method probably increases the level of physical activity in adult patients who are insufficiently active (GRADE $\oplus\oplus\oplus\oplus$ ).
- We suggest that the Swedish PAP model be used in the healthcare setting to increase the level of physical activity and be implemented as part of routine healthcare.

Although global consensus concludes that inadequate PA can cause health problems and that increased PA can improve health, evidence is still lacking with regard to optimal methods for increasing PA for people who would benefit from

view  
line  
/

see

ent  
nical  
demy,

len;

8

# Are physical activity interventions in primary care and the community cost-effective?

## A systematic review of the evidence

Sue Garrett, C Raina Elley, Sally B Rose, Des O'Dea, Beverley A Lawton and Anthony C Dowell

Based on the higher-quality studies, it is possible to deliver a physical activity intervention for between €1120 and €15 860 per QALY gained, which is more cost-effective than many other currently-funded pharmaceutical interventions. Therefore, physical activity interventions delivered in primary health care should be considered for funding at similar levels to currently-funded pharmaceutical interventions.

### ABSTRACT

#### Background

The health and economic burden of physical inactivity is well documented. A wide range of primary care and community-based interventions are available to increase physical activity. It is important to identify which components of these interventions provide the best value for money.

#### Aim

To assess the cost-effectiveness of physical activity interventions in primary care and the community.

#### Design of study

Systematic review of cost-effectiveness studies based on randomised controlled trials of interventions to increase adult physical activity that were based in primary health care or the community, completed between 2002 and 2009.

#### Method

Electronic databases were searched to identify relevant literature. Results and study quality were assessed by two researchers, using Drummond's checklist for economic evaluations. Cost-effectiveness ratios for moving one person from inactive to active, and cost-utility ratios (cost per quality-adjusted life-year [QALY]) were compared between interventions.

#### Results

Thirteen studies fulfilled the inclusion criteria. Eight studies were of good or excellent quality. Interventions, study populations, and study designs were heterogeneous, making comparisons difficult. The cost to move one person to the 'active' category at 12 months was estimated for four interventions ranging from €331 to €3673. The cost-utility was estimated in nine studies, and varied from €348 to €66 877 per QALY.

#### Conclusion

Most interventions to increase physical activity were cost-effective, especially where direct supervision or instruction was not required. Walking, exercise groups, or brief exercise advice on prescription delivered in person, or by phone or mail appeared to be more cost-effective than supervised gym-based exercise classes or instructor-led walking programmes. Many physical activity interventions had similar cost-utility estimates to funded pharmaceutical interventions and should be considered for funding at a similar level.

#### Keywords

costs and cost analysis; exercise; primary health care; review, systematic.

### INTRODUCTION

The prevalence of physical inactivity remains high in developed and developing countries.<sup>1</sup> Not only does physical inactivity contribute to increased prevalence of chronic conditions such as cardiovascular disease, obesity, type 2 diabetes, osteoporosis, colon cancers, depression, and fall-related injuries, but it also contributes to between 1.5% and 3.0% of direct healthcare costs in developed countries.<sup>1</sup> A wide range of interventions have been shown to increase physical activity.<sup>2</sup> However, it is essential to identify which components provide the best value for money.

Physical activity counselling in primary health care has been recommended.<sup>3</sup> In some countries at least 80% of the population visit primary health care annually,<sup>4,5</sup> making this an ideal setting for intervening to increase physical activity. Furthermore, patients expect to receive health-related messages in this

*S Garrett, MPH, Research fellow; SB Rose, PhD, senior research fellow; BA Lawton, ONZM, FRNZCGP, DObst, director, Women's Health Research Centre; AC Dowell, FRCGP, FRNZCGP, professor, Department of Primary Health Care and General Practice; D O'Dea, BSc, BA, lecturer, Department of Public Health, University of Otago, Wellington, New Zealand. CR Elley, PhD, MBChB, senior lecturer, Department of General Practice and Primary Health Care, School of Population Health, University of Auckland, Auckland, New Zealand.*

#### Address for correspondence

Sue Garrett, Women's Health Research Centre, Department of Primary Health Care and General Practice, University of Otago, Wellington, PO Box 7343, Wellington South, New Zealand. E-mail: susan.garrett@otago.ac.nz

Submitted: 23 March 2010; Editor's response: 24 May 2010; final acceptance: 27 July 2010.

©British Journal of General Practice

This is the full-length article (published online 28 Feb 2011) of an abridged version published in print. Cite this article as: *Br J Gen Pract* 2011; DOI: 10.3399/bjgp11X561249.

## Clinical practice implications of this study

The findings of our review suggest that exercise and many drug interventions are often potentially similar in terms of their mortality benefits; exercise interventions should therefore be considered as a viable alternative to, or alongside, drug therapy. Indeed, an increasing number of experts recommend prescribing an “exercise pill” as a preventive strategy to reduce morbidity and mortality.<sup>53–54</sup> According to the US Centers for Disease Control and Prevention, roughly one third of clinicians prescribe exercise in primary care.<sup>55</sup> However, as previous systematic reviews have shown, there is considerable uncertainty as to the effectiveness of primary care interventions for increasing physical activity.<sup>56–57</sup> As previously recommended, primary care doctors should give brief advice to most patients about the benefits of exercise and refer patients with chronic disease to a rehabilitation programme that includes an exercise intervention.<sup>58</sup>

## Comparative effectiveness of exercise and drug interventions on mortality outcomes: metaepidemiological study

 OPEN ACCESS

Huseyin Naci *researcher*<sup>1</sup> *fellow*<sup>2</sup>, John P A Ioannidis *director*<sup>3</sup>

<sup>1</sup>LSE Health, London School of Economics and Political Science, London, UK; <sup>2</sup>Drug Policy Research Group, Department of Population Medicine, Harvard Medical School and Harvard Pilgrim Health Care Institute, Boston, MA, USA; <sup>3</sup>Stanford Prevention Research Center, Stanford University School of Medicine, Stanford, CA, USA

### Abstract

**Objective** To determine the comparative effectiveness of exercise versus drug interventions on mortality outcomes.

**Design** Metaepidemiological study.

**Eligibility criteria** Meta-analyses of randomised controlled trials with mortality outcomes comparing the effectiveness of exercise and drug interventions with each other or with control (placebo or usual care).

**Data sources** Medline and Cochrane Database of Systematic Reviews, May 2013.

**Main outcome measure** Mortality.

**Data synthesis** We combined study level death outcomes from exercise and drug trials using random effects network meta-analysis.

**Results** We included 16 (four exercise and 12 drug) meta-analyses. Incorporating an additional three recent exercise trials, our review collectively included 305 randomised controlled trials with 339 274 participants. Across all four conditions with evidence on the effectiveness of exercise on mortality outcomes (secondary prevention of coronary heart disease, rehabilitation of stroke, treatment of heart failure, prevention of diabetes), 14 716 participants were randomised to physical activity interventions in 57 trials. No statistically detectable differences were evident between exercise and drug interventions in the secondary prevention of coronary heart disease and prediabetes. Physical activity interventions were more effective than drug treatment among patients with stroke (odds ratios, exercise v anticoagulants 0.09, 95% credible intervals 0.01 to 0.70 and exercise v antiplatelets 0.10, 0.01 to 0.62). Diuretics were more effective than exercise in heart failure (exercise v diuretics 4.11, 1.17 to 24.76). Inconsistency between direct and indirect comparisons was not significant.

**Conclusions** Although limited in quantity, existing randomised trial evidence on exercise interventions suggests that exercise and many drug interventions are often potentially similar in terms of their mortality

benefits in the secondary prevention of coronary heart disease, rehabilitation after stroke, treatment of heart failure, and prevention of diabetes.

### Introduction

Physical activity has well documented health benefits.<sup>1</sup> Population level cohort studies have shown that people who exercise enjoy a higher quality of life and improved health status compared with those with sedentary behaviours, with subsequent reductions in their risk of adverse outcomes such as admissions to hospital. Randomised controlled trials have shown similarly favourable findings in arthritis,<sup>2</sup> cancer,<sup>3–4</sup> diabetes,<sup>5</sup> heart disease,<sup>6</sup> and respiratory illnesses,<sup>7</sup> among other chronic conditions.<sup>8–9</sup> Large scale observational studies have also established a clear association between exercise and all cause mortality.<sup>10–12</sup> Given the overwhelming evidence in support of the health benefits of exercise,<sup>13</sup> the Global Burden of Disease study has recently ranked physical inactivity as the fifth leading cause of disease burden in western Europe, and as one of the top modifiable risk factors along with smoking.<sup>14</sup>

Despite recent calls to encourage physical activity as a strategy to ward off the emerging burden of chronic conditions, including heart disease and diabetes,<sup>15</sup> population level physical activity measures are discouraging. In the United Kingdom, only 14% of adults exercise regularly, with roughly one third of adults in England meeting recommended levels of physical activity.<sup>16</sup> In contrast, utilisation rates of prescription drugs continue to rise sharply, increasing to an average of 17.7 prescriptions for every person in England in 2010, compared with 11.2 in 2000.<sup>17</sup>

Abundant evidence from randomised controlled trials shows the mortality benefits of certain drugs such as simvastatin in the secondary prevention of cardiovascular disease,<sup>18</sup> which is





## Effectiveness of physical activity promotion interventions in primary care: A review of reviews<sup>☆</sup>



Alvaro Sanchez<sup>\*</sup>, Paola Bully, Catalina Martinez, Gonzalo Grandes

Primary Care Research Unit of Bizkaia, Basque Health Service-Osakidetza, Bilbao, Spain

## Conclusions

Supported by clear evidence of small but positive results provided by several high-quality reviews, we advocate for interventions in PC settings designed to increase PA levels of patients. Interventions that include multiple behavioral change techniques and those targeted to insufficiently active or sedentary patients seem to have better results.

### ARTICLE INFO

Available online 26 September 2014

**Keywords:**  
Physical activity  
Health promotion  
Primary care  
Review

### ABSTRACT

**Objective.** The present review aims to summarize the evidence about the effectiveness of physical activity (PA) promotion interventions in primary care (PC) and the intervention or sample characteristics associated with greater effectiveness.

**Methods.** MEDLINE, EMBASE, and Cochrane Library were searched to identify systematic reviews and meta-analyses published from 2002 to 2012 that assessed the effectiveness of PA-promoting interventions in PC. Information was extracted and recorded about each of the selected studies and their reported results. Methodological and evidence quality was independently rated by two reviewers using the nine-item OQAQ scale and the SIGN classification system.

**Results.** Ten of the 1664 articles identified met the inclusion criteria: five meta-analyses, three systematic reviews, and two literature reviews. Overall, PA promotion interventions in PC showed a small to moderate positive effect on increasing PA levels. Better results were obtained by interventions including multiple behavioral change techniques and those targeted to insufficiently active patients. No clear associations were found regarding intervention intensity or sample characteristics.

**Conclusion.** Although several high-quality reviews provided clear evidence of small but positive effects of PA intervention in PC settings, evidence of specific strategies and sample characteristics associated with greater effectiveness is still needed to enhance the implementation of interventions under routine clinical conditions.

© 2014 Elsevier Inc. All rights reserved.

### Background

The numerous health benefits of regular physical activity (PA) are well known. Accordingly, it is recommended that adults perform at least 150 min/week of moderate-intensity PA, 75 min/week of vigorous PA, or a combination of moderate and vigorous PA (Haskell et al., 2007). However, a majority of the population in developed countries does not follow these recommendations, making PA promotion a public health priority (Tucker et al., 2011; Hallal et al., 2012).

Primary care (PC) practitioners can play a key role in promoting PA and improving population health in developed countries because of the ongoing care they provide to a large sector of the population (Estabrooks et al., 2003). It is estimated that up to 80% of adults in these countries visit their general practitioner (GP) at least once a year

(van Doorslaer et al., 2006). Until recently, evidence about the effectiveness of interventions promoting PA in routine PC practice, especially in the long term, has been considered inconclusive (Foster et al., 2005; Muller-Riemenschneider et al., 2008). Newer studies have concluded in favor of PA interventions in the primary care setting, and recent meta-analyses indicate that the evidence appears to be shifting in this direction (Lin et al., 2010; Orrow et al., 2012; Hillsdon, 2013).

The high prevalence of inactivity in the population and the many obstacles faced by PC professionals in a setting characterized by work overload and a shortage of time and specialized training (Estabrooks and Glasgow, 2006; Grandes et al., 2008) combine to support the need for clear evidence of what can be achieved in PA promotion within primary care settings. Nonetheless, several challenges exist. First, there is no clear agreement among PC organizations and evidence-gathering agencies on the recommendations for PA promotion within the PC context. For example, the United States Preventive Services Task Force (USPSTF) currently recommends selective PA counseling rather than incorporating the message into routine practice in the general population (Moyer and U.S. Preventive Services Task Force, 2012); the United Kingdom's National Institute for Health and Clinical Excellence (NICE) also recommends that the National Health Service provides brief advice to adults who have been assessed as being inactive (National Institute for Health and Care Excellence, 2013), but the Royal Australian College

<sup>☆</sup> Sources of support: The project has received funding from a Network for Prevention and Health Promotion in Primary Care (redIAPP, RD12/0005) grant, research project grants (PI13/00573, PI12/02635, PI12/01914 and PS09/01461) from the Instituto de Salud Carlos III (Institute of Health Carlos III) of the Ministry of Economy and Competitiveness (Spain), co-financed with European Union ERDF funds, and Health Department of the Basque Government (EKP: 2009111072 and 2007111009).

<sup>\*</sup> Corresponding author at: Unidad de Investigación de Atención Primaria, Osakidetza, Luis Power 18, 4<sup>a</sup> planta, E-48014 Bilbao, Spain. Fax: +34 946006639.  
E-mail address: [alvaro.sanchezperez@osakidetza.net](mailto:alvaro.sanchezperez@osakidetza.net) (A. Sanchez).

## What is already known on this topic

- ▶ Internet use continues to grow throughout the world, and can now be used to reach an extensive array of individuals, covering a wide spectrum of the world population.
- ▶ Internet-based physical activity interventions have been shown to be just as effective as other types of physical activity interventions (eg, print based); however, more work is needed.
- ▶ More often than not, physicians counsel only a minority of their patients about making a health behaviour change, as time is a major limiting factor.

## What this study adds

- ▶ This paper serves as a call to action for increasing research on using internet-based physical activity programmes within the context of a primary care setting.
- ▶ Clinicians need access to electronic databases from which they can choose effective programmes to refer their patients to, as this has the potential to facilitate a successful change in behaviour.
- ▶ The future of internet-based physical activity research will harness the power of the internet; that is, a low cost, high reach, easily accessed physical activity programme available upon consumer demand.

## Using electronic/computer interventions to promote physical activity

B H Marcus,<sup>1</sup> J T Ciccolo,<sup>2</sup> C N Sciamanna<sup>3</sup>

<sup>1</sup> Department of Community Health and Department of Psychiatry and Human Behavior, Brown University, Providence, Rhode Island, USA;

<sup>2</sup> Department of Community Health and the Centers for Behavioral and Preventive Medicine, Brown Medical School and the Miriam Hospital, Providence, Rhode Island, USA;

<sup>3</sup> Pennsylvania State College of Medicine, Division of General Internal Medicine, Hershey, Pennsylvania, USA

Correspondence to: Dr B H Marcus, Department of Community Health and Department of Psychiatry and Human Behavior, Brown University, 121 South Main Street, 8th floor, Providence, Rhode Island 02903, USA; bess\_marcus@brown.edu

Accepted 18 September 2008  
Published Online First  
2 December 2008

### ABSTRACT

The internet has been used as a method to deliver various health interventions (eg, weight management, smoking cessation, increasing physical activity). An electronic search (ie, PubMed, PsycInfo, Web of Science) for internet-based physical activity interventions among adults yields fewer than 25 studies. Although many have considered physical activity as one element of a multifactorial behavioural intervention, few have focused exclusively on changing sedentary behaviour. Overall, current results are encouraging and it appears that response to an internet-based physical activity intervention is similar to response to other more established, effective interventions. Given that primary care referrals for physical activity are successful in changing sedentary behaviour to some extent, there is an urgent need for investigations into the effect of using an internet-based physical activity programme within the context of primary care. Although no studies that have combined an established internet-based physical activity programme with primary care were found, there is evidence that significant progress would probably be made by providing clinicians with information on internet-based physical activity programmes.

There is now a growing body of literature on the use of the internet as a tool to promote health behaviour change. Researchers have used internet interventions for numerous topics including weight management, smoking cessation, stress reduction, blood glucose control, reducing alcohol consumption and increasing physical activity. Currently, interventions focused specifically on changing physical activity behaviour are in their infancy, with fewer than 15 randomised controlled trials having been conducted. Thus far, the studies completed suggest that internet programmes are helpful in changing sedentary behaviour. However, more studies with larger samples and individualised treatment plans are needed,<sup>1, 2</sup> including those that take into account how primary care can facilitate a change in behaviour by utilising internet-based health-promoting resources. In this review, we describe several internet-based studies that have produced a beneficial effect on changing participants' physical activity behaviour and we present some of the limitations of these studies.

### INTERNET USE

Worldwide, it is estimated that 21.9% of the population (ie, roughly 1.5 billion) use the internet.<sup>3</sup> The USA and the UK are among the top 10 countries with the highest internet usage (the USA is ranked second and the UK is ranked seventh),<sup>3</sup> with 72% of US and 67% of UK internet users going online every day or almost every day. Although only 27% of internet users in the UK have looked for health information online,<sup>4</sup> approximately 80% of the internet users in the USA have reported searching for health information<sup>5</sup> and 44% have searched for information specifically about fitness and nutrition.<sup>6</sup> In both the USA and the UK, use is high among all age groups, with approximately 90% of younger individuals (aged 16–24 years) and up to 72% of older adults (aged 55 years and older) online.<sup>4, 7</sup> Rates are similar for both genders, with 76% of men and 74% of women in the USA and 71% of men and 62% of women online in the UK.<sup>4, 7</sup> Whereas there are some demographic differences among users; overall, the internet has broad reach in the USA. Although internet use is lower among those who live in a rural area (64% online), those with less than a high school education (38% online), or those with an annual income of less than US\$30 000 (61% online),<sup>8</sup> its use remains high among all racial/ethnic groups, with 76% of non-Hispanic whites, 60% of African Americans and 56% of Hispanics online. Moreover, among English-speaking Hispanics, internet use exceeds that of non-Hispanic whites (79% vs 76%).<sup>9</sup>

Given the above, it is clear that the internet can now be used to reach a very large number of individuals, covering a wide spectrum of the population. Moreover, because individuals' lifestyles often do not permit the time for office visits on health information and advice and physicians counsel only a minority of their patients about physical activity,<sup>10</sup> the internet can also provide a more time-efficient and convenient method of information delivery, particularly if it were to be paired with primary care. Yarnall and colleagues<sup>11</sup> estimated that providing preventive care alone, in keeping with evidence-based guidelines, may take up to 8 h per day for a primary care provider, highlighting the time constraints of activities such as physical activity counselling. As such, using the internet as a resource to provide physical activity advice or programming for those who would otherwise not receive it is now a potential possibility.

# Meðferð með hreyfiseðli í kjölfar meðgöngusýki

Pórunn Jóhanna Júlíusdóttir<sup>1,2</sup> lækni

Hannes Hrafnkelsson<sup>1,2</sup> lækni

Ragnheiður I. Bjarnadóttir<sup>1,2,3</sup> lækni

Sesselja Guðmundsdóttir<sup>3</sup> hjúkrunarfræðingur

Ragnheiður Bachmann<sup>1,3</sup> ljósmóðir

Karitas Ívarsdóttir<sup>1,3</sup> ljósmóðir

Jón Steinar Jónsson<sup>1,2,3</sup> lækni

<sup>1</sup>Heilsugæslu höfuðborgarsvæðisins, <sup>2</sup>Háskóla Íslands,

<sup>3</sup>Próunarmiðstöð Íslenskrar heilsugæslu.

Fyrirspurnum svarar Pórunn J. Júlíusdóttir

[thorunn.johanna.juliusdottir@heilsugaeslan.is](mailto:thorunn.johanna.juliusdottir@heilsugaeslan.is)

## Inngangur

Meðgöngusýki er vaxandi vandamál á heimsvísu og benda erlendar rannsóknir til þess að algengi sé frá <1-28%.<sup>1</sup> Á Íslandi hefur tíðnin aukist umtalsvert á síðustu árum og árið 2018 greindust 613 konur, eða samtals 16% kvenna sem voru í mæðravernd hjá Heilsugæslu höfuðborgarsvæðisins (HH), með meðgöngusýki.

Til samanburðar voru greiningarnar einungis 209 árið 2014, sem sýnir að fjöldi kvenna í mæðravernd hjá HH sem greindust með meðgöngusýki brefaldadist á árunum 2014-2018. Sam-

## Á G R I P

### TILGANGUR

Algengi meðgöngusýki fer hratt vaxandi og tæplega 19% kvenna sem fæddu á Landspítala á árinu 2018 höfðu þessa greiningu. Þær konur sem fá meðgöngusýki eru í aukinni hættu að fá hana aftur á síðari meðgöngum og einnig í aukinni áhættu á að þróa sykursýki tegund 2 síðar á ævinni. Ofþyngd og hreyfingarleysi eru sterkir áhættuþættir. Hreyfiseðill er meðferðarúrræði sem stendur til boða á öllum heilbrigðisstofnunum. Markmið rannsóknarinnar var að kanna áhrif meðferðar með hreyfiseðli eftir fæðingu hjá konum sem höfðu meðgöngusýki, á virkni þeirra, líðan og þætti sem tengjast efna-skiptavillu.

### EFNIVÍÐUR OG AÐFERÐIR

Konur sem fæddu börn frá 1. janúar 2016 til 30. júní 2017, voru í mæðravernd hjá Heilsugæslu höfuðborgarsvæðisins og greindust með meðgöngusýki var boðin þátttaka. Þátttakendum var skipt tilviljanakennt í tvo hópa þar sem annar hópurinn fékk meðferð með hreyfiseðli í 5 mánuði en viðmiðunarhópurinn hefðbundna meðferð. Mælingar á blóðgildum, hæð, þyngd, virkni og líðan voru gerðar þremur mánuðum og 8 mánuðum eftir fæðingu.

### NIÐURSTÖÐUR

Áttatíu og fjórar konur tóku þátt, 45 í íhlutunarahópi og 39 í viðmiðunarahópi. Virkni jókst marktækt í íhlutunarahópi en ekki urðu marktækar breytingar á blóðmælingum. Viss áhrif en ekki marktæk mældust á þyngd, líkamsþyngdarstuðli og lífsgæðum. Þær konur sem voru með barn sitt á brjósti voru með marktækt lægra insúlín en þær konur sem ekki voru með barn sitt á brjósti. Sterkari fylgni var á milli þyngdar og insúlíns en á milli fastandi blóðsykurs og insúlíns.

### ÁLYKTUN

Meðferð með hreyfiseðli eftir fæðingu jók marktækt virkni kvenna sem höfðu meðgöngusýki. Brjóstgjöf hefur mögulega áhrif til lækkunar insúlíns.



**Eight Steps To  
Successful Change  
- John Kotter**



Establish a sense of urgency

Create a guiding coalition

Develop a clear shared vision

Communicate the vision

Empower people to act on the vision

Create short term wins

Consolidate & build on the gains

Institutionalise the change

