Sustainability in Health Care: the right person in the right place at the right time

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Background

• UK population is increasing
  • 13% increase expected 2013-2037 to total of 73.3 million
• UK population is ageing
  • Increased life expectancy
  • Number of UK residents 90 and over has trebled in last 30 years
  • Old age dependency ratio predicted to increase- fewer people of working age to support a larger older population
• Scotland pattern is similar
Changing demography

United Kingdom

Scotland

Health Care Implications

• Pressures on health budgets
  • Increasing need and demand for health care
  • Increasing price of delivering health care (staff, drugs, procedures)
  • Spending on workforce largest single item of health care expenditure
  • Staff costs are 65% of Scottish health care spend
    • 2016-17: £12.4 billion
• Costs of training medical staff are substantial (€0.6/0.7 million GP/Consultant in UK) and returns on that investment declining
  o Number of hours worked reducing - more part-time working
  o Skills are transferable and labour is mobile
• Sustainability at stake
Service redesign: a possible solution

- New technologies
  - Technological advances
  - New understanding of care pathways
- New protocols changing the way health care can be delivered
- New and extended health care roles
  - Potential to enhance delivery and contain costs
  - Require changes to workforce and workforce planning
The Scottish approach?

• National Clinical Strategy for Scotland 2016
  • ‘We need to do more to maximise the contribution from the whole healthcare workforce and be prepared to change the way in which we deliver services.’
• Healthy organisational culture
• Sustainable workforce
• Capable workforce
• Workforce to deliver integrated care
• Effective leadership management

• Advanced nurse practitioners
• Pharmacists with extended roles
• Other allied health professionals
• Physician associates
Could workforce redesign support sustainability in health care?

- The research evidence
- The reality
- The outcomes
- Making change happen
- Longer term implications
Research evidence that new roles are effective and efficient?
New nursing roles: a systematic review of specialist and advanced nursing roles

- 41 evaluation studies included
- Specialist nurses
  - 3/3 improved health care utilisation
  - 5/6 improved patient information
  - 4/6 improved patient satisfaction
- Advanced nurses
  - 5/5 improved clinical outcome
  - 3/4 improved patient information
  - 5/8 improved patient satisfaction
- Health Economics
  - No effect

Tsiachristas, A., Wallenburg, I., Bond, C.M., Elliott, R.F., Busse, R., van Exel, J., Rutten-van Molken, M.P., de Bont, A., the MUNROS team
New pharmacist roles: RCT of prescribing for chronic pain

- Pharmacist training
  - 36 patients per practice (6)
    - Baseline questionnaire

- Prescribing (n = 78)
- Review (n = 78)
- Control (n = 60)

- Patient 3 & 6 month follow-up

- Interview GP
- Interview pharmacist
- Questionnaire patient

Chronic Pain Grade (disability and intensity sub-scales)
Hospital Anxiety and Depression Scale, General health (SF-12) and preference based index (SF-6D), Health Utilities Index, ICECAP (capability), Demographic information and cost implications

Expectations, experiences and satisfaction (3 months only)
Chronic Pain Grade

Improved CPG: **48% in prescribing arm (ss), 39% in review (ss) and 31% in controls (ns)**

Always good to have the services of a specialist!

She was professional, relaxed, pleasant and interested. Excellent!

A waste of time, altered my tablets which made my pain worse
A new profession: Physician Associates

- In UK/Scotland numbers increasing slowly – currently 200ish
- Sparse evidence in UK and no ‘hard’ evidence
- International literature similar
  - 47/2167 papers included
  - ‘Studies of costs provide mixed results. Outcomes: acceptability to patients and potential patients is consistently found to be high, and studies of appropriateness report positively. Overall the evidence was appraised as of weak to moderate quality…. little comparative data presented
- Overall little research evidence
The reality

• The European perspective
• Are new roles contributing to health care delivery in practice?
• What does this mean for workforce planning
The project overview

- What is known already:
  - Review of health systems
  - Literature review

- Primary data collection:
  - Case studies
  - Questionnaires
  - Routine data

- Applying theoretical approaches

- Using the data:
  - Health economic analysis
  - Optimal models
  - Workforce planning tool

- >100 hospital sites and primary care

- 9 countries
  - 3 conditions

- Routine data

- >100 hospital sites and primary care

- 12 hospitals and primary care settings per country

Heart disease (STEMI)
Breast cancer
Type 2 diabetes
The project: preliminary studies

- **Review of health systems**
  - Literature review
  - 9 countries
  - What is known already

- **Case studies**
  - Questionnaires
  - Routine data
  - Primary data collection

- **Applying theoretical approaches**

- **Using the data**
  - Health economic analysis
  - Optimal models
  - Workforce planning tool

- **>100 hospital sites and primary care**

- **Using the data**
  - Health economic analysis
  - Optimal models
  - Workforce planning tool
Three main groups of countries

New professions:
England, Scotland, Netherlands

Extended roles:
Czech Rep., Germany, Italy, Turkey

Minimal formal change:
Norway, Poland

<table>
<thead>
<tr>
<th>Typology</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>New professions</td>
<td>possess legal autonomy and clinical responsibility; conduct clinical work that used to be done by doctors</td>
<td>Advanced nurse practitioner, physician associate, non-medical prescriber</td>
</tr>
<tr>
<td>Extended roles</td>
<td>deliver care in a very specific clinical area; health service redesign, within medical domain</td>
<td>diabetes nurse</td>
</tr>
<tr>
<td>Technical roles</td>
<td>conduct specific technical tasks in care process</td>
<td>dialysis technician, retinal screener</td>
</tr>
</tbody>
</table>
Case study findings

- Variation between and within countries
- Existing professions (particularly nurses) extend their roles in daily practice, both **formal and informal** to “get the job done”
- Tasks undertaken depend on **attitude and flexibility of established professionals**
  - Often a single individual – the medical team leader
  - Trust in and experience of individual practitioners (the new professional role) are key
- New professional roles evolve as clinical care develops
- **Impact of new professional roles is significant but small**
- New professional roles encourage patient centered care; improved patient involvement
The project: surveys

- **Patients** (1047 BC, 1137HD, 775 T2D)
- **Professionals** (948 BC, 1006 HD, 748 T2D) and managers (251 BC, 301 HD, 259 T2D)

**Questionnaires**

- 9 countries
- What is known already
- Review of health systems
- Literature review
- Routine data
- Primary data collection
- Case studies
- *Using the data*
- Applying theoretical approaches
- Health economic analysis
- Optimal models
- Workforce planning tool
- >100 hospital sites and primary care
Patient perceptions of substitution: tasks previously done by doctors now done by others (Scotland)
Changes in staff roles: Health Care Professional perceptions (Scotland)

Breast cancer
- 58% Yes
- 42% No

Heart disease
- 59% Yes
- 41% No

Type 2 diabetes
- 56% Yes
- 44% No

Ways roles have changed:
- Extended roles under supervision
- New independent roles
- New technical roles
- New admin. Roles

- Breast cancer
- Heart disease
- Type 2 diabetes
## Task list: breast cancer care pathway

<table>
<thead>
<tr>
<th>Stage</th>
<th>Area of activity</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosis</td>
<td>Eg Assessing staging</td>
<td>Eg physical examination</td>
</tr>
<tr>
<td>Carrying out surgery/managing therapy</td>
<td>Surgical treatment</td>
<td>Inform patient</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pre-operative preparation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assist surgeon</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Perform surgical procedure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post operative nursing care</td>
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<tr>
<td></td>
<td></td>
<td>Post operative medical care</td>
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<td></td>
<td></td>
<td>Administrative work</td>
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<td></td>
<td>Chemotherapy</td>
<td></td>
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<td></td>
<td>Radiation therapy</td>
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<td></td>
<td>Hormone treatment</td>
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<tr>
<td></td>
<td>Biological therapy</td>
<td></td>
</tr>
<tr>
<td>Follow up/managing complications</td>
<td>Eg Detecting metastatic disease</td>
<td>Eg physical examination</td>
</tr>
<tr>
<td>Palliative care</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Skill mix on the breast cancer pathway

Breast Cancer: Physical Exam (Assessing staging)

<table>
<thead>
<tr>
<th></th>
<th>Scotland</th>
<th>England</th>
<th>Poland</th>
<th>Czech Republic</th>
<th>Turkey</th>
<th>Germany</th>
<th>The Netherlands</th>
<th>Italy</th>
<th>Norway</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Consultant</td>
<td>Consultant</td>
<td>Consultant</td>
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<td>Consultant</td>
<td>Consultant</td>
<td>Consultant</td>
<td>Consultant</td>
<td>Consultant</td>
</tr>
<tr>
<td>2</td>
<td>Junior Dr</td>
<td>Junior Dr</td>
<td>Junior Dr</td>
<td>Junior Dr</td>
<td>Junior Dr</td>
<td>Junior Dr</td>
<td>Advanced Nurse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>GP</td>
<td>Specialist Nurse</td>
<td>GP</td>
<td>GP</td>
<td>General Nurse</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4</td>
<td>Specialist Nurse</td>
<td>General Nurse</td>
<td>General Nurse</td>
<td>General Nurse</td>
<td>General Nurse</td>
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<td></td>
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<tr>
<td>5</td>
<td>General Nurse</td>
<td></td>
<td>Adv. Radiographer</td>
<td></td>
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<tr>
<td>6</td>
<td>Adv. Radiographer</td>
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% Staff group performing the task

[Graph showing the percentage of staff group performing tasks across different countries.]
Percentage of staff group performing the task

Breast Cancer: Physical Exam (Metastatic Disease)

Breast Cancer: Perform Surgical Procedure
Measure of Relative Nurse Involvement (MORNI)

Measure of Relative Nurse Involvement = Odds Ratio Nurse/ Odds Ratio Physician

Patient reported task substitution is similar but not the same as the MORNI
The outcomes
Patient satisfaction (Scotland) (1-7) median scores

Breast cancer
Heart disease
Type 2 diabetes

- Waiting time
- Care provider
- Continuity of care
- Length of visit
- Information provided
- Frequency
- Overall
# Satisfaction and substitution (mean scores)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Waiting time</th>
<th>Care provider</th>
<th>Continuity of care</th>
<th>Visit length</th>
<th>Information provided</th>
<th>Visit frequency</th>
<th>Satisfaction with last visit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast cancer</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Heart disease</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Type 2 diabetes</td>
<td>+</td>
<td>=</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>=</td>
<td>+</td>
</tr>
</tbody>
</table>

**Legend:**
- BC all
- BC sub
- HD all
- HD sub
- T2D all
- T2D sub
MORNI Effect on health outcomes in Scotland...

- **Length of patient stay**
  - Breast Cancer: -0.52
  - Type 2 Diabetes: -0.46
  - Heart Disease: 0.1

- **28-day Emergency Readmission Rate**
  - Marginal Effect on Probability: -0.97

- **30-day Survival Rate**
  - Marginal Effect on Probability: -0.04
Composition of health care costs per patient

- **BC (total):**
  - Medication: 54%
  - Treatment procedures: 58%
  - Diagnostic procedures: 32%
  - Hospitalization: 32%
  - Visits to professionals: 16%

- **BC (Scotland):**
  - Medication: 33%
  - Treatment procedures: 29%
  - Diagnostic procedures: 32%
  - Hospitalization: 16%
  - Visits to professionals: 16%

- **HD (total):**
  - Medication: 56%
  - Treatment procedures: 64%
  - Diagnostic procedures: 16%
  - Hospitalization: 0%
  - Visits to professionals: 0%

- **HD (Scotland):**
  - Medication: 76%
  - Treatment procedures: 29%
  - Diagnostic procedures: 76%
  - Hospitalization: 29%
  - Visits to professionals: 0%
Costs by country (past three months), compared to overall mean

- Main driver of costs is health status
- Higher nurse involvement associated with lower costs in heart disease, but neutral for BC and T2D
Making change happen

External factors

Internal factors

Staff motivators
External factors driving skill mix changes (Scotland)

Key drivers for skill mix are: Shifting influences of professional groups, Redesign of services, New technology
Perceptions of factors affecting personal opportunities for undertaking new roles: health care professionals (Scotland)

- Professional support ++
- Management support
- Information technology
- Workforce shortages in other profession
- Need for increased productivity
- Medical technology
- Increased requ. for academic qualifications
- Workforce shortages in your profession
- Risk management procedures
- Regulation and legislation

[Bar chart showing percentages of perceptions for each factor]
For all conditions, personal satisfaction is cited as a motivating factor by most responders.
Longer term implications for workforce

“A society grows great when old men plant trees whose shade they know they shall never sit in.” Greek Proverb
Learning from the data

Breast cancer mammograms

• **Data:** In Scotland, *medical consultants (MC)* in the MUNROS dataset who perform mammograms, perform them on **100%** of the patients they see; *Advanced radiographers (AR)* in the MUNROS dataset who perform mammograms, perform them on **66%** of patients that they see.

• **Estimates:** If ARs were to be used for all mammograms:
  1. What is the AR time required per hundred breast cancer patients diverted to ARs?
  2. What is the MC time released by this substitution?
Conclusions

• **Skill mix changes are important** for a future **sustainable** health workforce
• Changing skill mix can occur without major increases in workforce hours and **may reduce costs**
• **Patients will accept changes and outcomes MAY/CAN improve**
• **Change needs time**, ‘bottom up’ as well as ‘top down’ support
• Workforce planning must be based on competences required not uni-professional approaches
• **Anticipated increases in demand can be met if we use the wider health care team**
‘Health care will increasingly be delivered by teams of professionals united by common professional values with effective clinical leadership’

‘We need planning of training and recruitment for all types of clinicians to ensure...capacity to deliver services...in the future’

Right person
Right place
Right time

National Clinical Strategy for Scotland 2016
Acknowledgements and thank you to...

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- All research participants
And thank you for listening!
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MUNROS project
www.abdn.ac.uk/MUNROS