DaPPHne (Diagnosing Potentially Preventable Hospitalisations):
Understanding unplanned hospital admissions for chronic conditions
DaPPHne collaborators

DaPPHne partners

• Mid North Coast LHD
• Western Sydney LHD
• North Coast Primary Health Network (NCPHN)
• NSW Agency for Clinical Innovation
• University Centre for Rural Health (UCRH), University of Sydney
• Centre for Big Data Research in Health, UNSW

DaPPHne funders

• MNCLHD
• WSLHD
• NCPHN
• NSW ACI
• UCRH
• Networking Health NSW (Stakeholder workshops)

DaPPHne research team

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Research nurses:

• Site 1: Charmaine Emerson and Helen Wildman
• Site 2: Emma Norris and Colleen Boyd
What are Potentially Preventable Hospitalisations (PPH)?

• Also known as Ambulatory Care Sensitive or Avoidable Admissions
• Based on diagnostic code at discharge
• Concept originated in New York in the early 1990s – Delphi process.
• **Admissions considered to be potentially preventable with effective, timely outpatient care in the period immediately prior to admission** – Billings et al 1993
• Actual preventability never confirmed empirically
What are Potentially Preventable Hospitalisations (PPH)?

- Widely adopted internationally
- “...considered to be largely preventable if timely and adequate care were provided through population health services, primary care and outpatient services” (AIHW).
- Rates of PPH considered a marker of “access” to care in the community
- Grouped into vaccine-preventable, acute and chronic conditions
- The rate of PPH is a KPI for hospitals and PHNs
PPH in Australia in 2015-16

• PPH accounted for 8.3% of public hospital separations

• 48% of all PPH admissions were *chronic* PPH admissions

• Nearly ¾ of all chronic PPH admissions are for congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD), diabetes complications and/or angina

• Higher rates in rural and remote areas

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PPH evidence gaps

• The proportion of PPHs which are actually preventable is unknown
Therefore:
• Use of PPH as a KPI may not be appropriate

• Factors contributing to PPH which are actually preventable are unknown
Therefore:
• Cannot develop evidence-based interventions to reduce preventable PPH
DaPPHne aims

- Determine the proportion of chronic PPH admissions among community dwelling patients ≥45 years that are classified as actually preventable
- Identify factors contributing to PPH admissions that are classified as preventable
- In order to inform the development of effective interventions to reduce PPH
- Recommend refinements to PPH measures to make them more robust as measures of health system performance.
DaPPHne definition of ‘preventable’ admission

• An unplanned admission which could have been prevented if:
  – Appropriate, adequate, accessible and good quality support in the community* had been available and accessed in the preceding 3 months, 
    and/or
  – Appropriate individual health behaviours e.g. disease self-management, had occurred in the 3 months prior to admission.

* Support in the community might include primary health care, family/neighbour/friend/social support, health or non-health community services
DaPPHne research design

• Mixed methods study of eligible patients admitted with chronic PPH admissions
• Two regional hospitals and one metropolitan hospital in NSW
• Community dwelling adults:
  – aged ≥ 45 years
  – unplanned admission
  – primary diagnosis of COPD, CHF, angina or diabetes complication
Comprehensive data collection

patient

hospital records

GP
Expert panel assessment of preventability

• Expert panel at each site
  – GP
  – Physician
  – Chronic Disease Nurse

• Case report from patient, GP, hospital records (admissions with ‘complete’ data)

• Assess preventability of admission (study definition of preventable admission)
  – Reasonably confident that this admission was preventable?
  – Reasonably confident that this admission was not preventable?

• Assessments made individually, consensus meetings as required
Regional hospitals screening and recruitment

- Screened (n=2909); deemed potentially eligible (n=907)
  - Missed (n=244)
  - Refused (n=210) 32%
  - Consented (n=453) 68%
    - Excluded (ineligible) (n=169)
    - Withdrew consent (n=3)
    - Remained in study (n=281)

  Complete data - Preventability assessed by Expert Panel (n=211)

  Incomplete data (no GP interview) Not assessed by Expert Panel (n=70)
Research Question #1

What proportion of chronic PPHs among patients ≥45 years are actually preventable?
What proportion of chronic PPH are actually preventable? (n=210)

Expert Panels assessed:
- 40% (n=83) Preventable
- 36% (n=75) NOT preventable
- 25% (n=52) Not classifiable

Differences between sites:
- Site 1 – 47% assessed as preventable
- Site 2 – 29%
Research Question #2

What are the characteristics of chronic PPH admissions?
Participant characteristics (n=210)

- Just over half were male, mean age 72 years (46-91)
- 11 (5%) were Aboriginal
- 75% retired; 82% had a household income <$40,000
- One third lived alone; 20% had little social support
- 1 in 3 reported mod/severe psychological distress (K10)
- 35% required help with daily tasks
- High users of health services, but in last 12/12
  - 36% didn’t attend GP when they needed to
  - 16% didn’t see specialist when they needed to
Multiple health problems (n=210)

- Principal diagnosis this admission:
  - 35% COPD
  - 29% diabetes +/- complications
  - 26% CHF
  - 10% angina
- 42% had 7 or more discharge diagnoses
- On average – 8 medications; and 78% on ≥5 meds
- 26% had a Webster pack
- 22% reported trouble knowing what their medications were for
Health risk behaviours (n=210)

- Poor diets: 86% had inadequate vegetable intake
- Low physical activity: 69% had none
- Among those with BMI recorded:
  - 73% obese
  - 20% overweight
Research Question #3

What factors are associated with admissions deemed preventable?
What factors are associated with those admissions deemed preventable (multivariate analysis)?

- Site (47% vs 29%)
- Regularly gets help with medical appointments
- Needed to attend GP in last 12 months but didn’t
- Social issues that impact their ability to manage health
- Hospital notes indicate that the patient is having difficulty managing at home
- Shorter length of stay (only 1 day)
- Lower total number of diagnoses on discharge
- Having a final principal diagnosis of CHF
What else do we know about the admissions classified as preventable?
(1st 150 admissions)
### Factors contributing to ‘preventable’ admissions (n=58)

<table>
<thead>
<tr>
<th>SYSTEMS Codes</th>
<th>CLINICIAN Codes</th>
<th>PATIENT codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing or inadequate or not referred to community-based services</td>
<td>GP care</td>
<td>Problems with adherence/self-management</td>
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<tr>
<td>Poor communication and linkages between services</td>
<td>Hospital care</td>
<td>Problems with patient’s engagement with existing services</td>
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<tr>
<td>Problems with specialist services</td>
<td>Both GP and hospital</td>
<td>Support needed</td>
</tr>
<tr>
<td>Ideas for General Practice</td>
<td>Other</td>
<td>Cost/logistics barriers to accessing services</td>
</tr>
<tr>
<td>Problems with outpatient services</td>
<td></td>
<td>Poor physical and/or cognitive functioning and/or mental health problems</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
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</tbody>
</table>
54 of 58 preventable admissions:

**Missing or inadequate or not referred to community-based services:**
- A broad variety of services:
  - Social and welfare support
  - Allied health
  - Diabetes educator
- Assessment required:
  - Social needs
  - ADL review
  - ACAT
- Waiting lists for rehab
- Services/programs too short with lack of follow up
- Not referred to e.g. cardiac nursing, home medicines review
- Few services (other than GP) in rural areas/towns

30 of 58 preventable admissions:

**Poor communication and linkages between services:**
- Links between acute and primary care
- Links between community based services
Clinician

40 of 58 preventable admissions:

GP care:
• most commonly coded ‘inadequate medical management’:
  • more investigation by GP
  • better monitoring, follow up and proactive GP support
  • pain and medication management
  • referrals e.g. to rehab or renal or cardiac nurse
  • use of the 75+ health assessment check
• lack of action plan
44 of the 58 preventable admissions:

Problems with adherence/self-management:
- medication adherence
- self-management
- patient needs education

36 of the 58 preventable admissions:

Problems with patient engagement:
- declined services
- should have seen GP earlier/frequently/regularly
Summary of findings

Cohort of patients with diverse and complex needs

What proportion of PPH are actually preventable?

Of 210 PPH admissions:

- 40% (n=83) assessed as preventable
- 36% (n=75) assessed as NOT preventable
- 25% (n=52) assessed as not classifiable

Variability in proportion by site (appropriate as a KPI?)

CHF admissions more likely assessed as preventable
Summary of findings (cont)

What factors contribute to ‘preventable’ admissions?

• Multiple potentially modifiable factors indicating complexity in trying to reduce these admissions
• Systems – communication, availability and clinician referrals
• Clinician – quality of care
• Patient – complexity of managing multiple conditions, poor health literacy, engagement with services and social issues all impacting on self-management
Thanks and acknowledgements

Our partners in this endeavour:

• All DaPPHne participants
• Mid-North Coast Local Health District
• Western Sydney Local Health District
• North Coast Primary Health Network
• NSW Agency for Clinical Innovation
• Centre for Big Data Research in Health, UNSW

• Networking NSW who funded stakeholder workshops