Analysing the COPD care pathway in Japan, Canada, England and Germany: a global view

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Introduction

- COPD is a preventable, progressive respiratory disease that is characterised by non-reversible airflow limitation and symptoms such as dyspnoea, persistent cough, sputum production and premature mortality.[1]
- COPD is a major cause of morbidity and mortality globally, causing 3.23 millions deaths in 2019.[2] COPD affects approximately 384 million people globally,[3] and is associated with significant resource burden, with global costs estimated to be US$2.1 trillion in 2010, and to rise to US$4.8 trillion by 2030.[4]
- Despite the availability of the Global Initiative for Chronic Obstructive Lung Disease (GOLD) recommendations for COPD management, there remains uncertainty around how care is currently delivered within individual countries, and what barriers exist to optimal COPD care delivery to improve outcomes for patients and reduce the burden on healthcare systems.
- The present study sought to characterise COPD care pathways in four countries (Canada, England, Germany, Japan), to identify barriers in the delivery of care, and to highlight opportunities for care policy reform.

Methods

Study design

- A convergent parallel mixed-methods approach was used to collect COPD pathway data in four countries (Canada, England, Germany, Japan). The study was conducted in two phases.

Phase 1

- A pragmatic targeted literature review was conducted on PubMed and grey literature to identify published country-specific economic, epidemiological and clinical data.
- Country-specific COPD care pathway diagrams were drafted by creating a general pathway framework using the GOLD recommendations, and then refining this using national guidelines and literature review results.
- Following this, an initial set of clinician interviews were conducted to shape, correct, and fill any knowledge gaps in the pathway. Pathways were then populated using data from the literature review.

Phase 2

- A second set of interviews were conducted with clinicians to validate and refine the pathways developed within phase 1 and identify and explore barriers to optimal care.

Participant selection

- Respiratory healthcare professionals (HCPs) directly involved in adult COPD patient care in the four countries were selected using purposive sampling.
- HCPs were recruited across care settings (primary, secondary, tertiary) to ensure all aspects of COPD care were considered, including specialist nurses, GPs, respiratory therapists, and respiratory specialists.

Interview process

- 24 clinicians (six from each country) were interviewed using semi-structured interviews. Interviews were digitally recorded and transcribed. One clinician from Germany and six from Japan requested an interpreter during the session to assist with comprehension or for full translation.

Data analysis

- A thematic analysis was conducted using NVivo, a qualitative data analysis computer software, to assess outputs from both phase 1 and phase 2 interviews.
- A deductive approach to the analysis was taken, using preconceived themes expected to be reflected in the data, e.g., pre-diagnosis, diagnosis, treatment and management, management of exacerbations, COVID-19.

Results

Overview to the issues

- Analysis showed common themes across the countries (although the main themes often manifest themselves differently at a national level). Therefore, the focus is on presenting a global view of the cross-cutting challenges to optimal care identified across all four countries.
- Three key themes were identified from the analysis: journey to diagnosis, treatment and management, and COVID-19.
- Issues identified were often interlinked. Consideration of COPD and the health care system infrastructure were present as underlying factors in issues identified.

Journey to diagnosis	Many patients remain undiagnosed or present with advanced COPD. The trigger to diagnosis is often an exacerbation.
Treatment & management	Sub-optimal acute and chronic disease management among non-specialists is common; available treatment options are not fully used.
COVID-19	Has accelerated existing healthcare trends and offered opportunities for improving parts of the care pathway.

Geographical differences

- The COPD care pathway, overall, remained the same across the countries (**Figure 1**). Availability of published data varied across countries, with a distinct lack of published data in Japan.
- There were some national differences between countries in how COPD care is delivered:

Free healthcare at the point of access in England meant that insurance and reimbursement were less likely to be a barrier to providing quality COPD care.

Rural settings affected patients' ability to be properly diagnosed, urgently treated for acute exacerbations, and have regular monitoring by HCPs. This issue was described in all countries but Canada's size presents an additional challenge.

A disease management programme (DMP) is available in Germany, but there is a lack of consensus among HCPs on its cost-effectiveness.

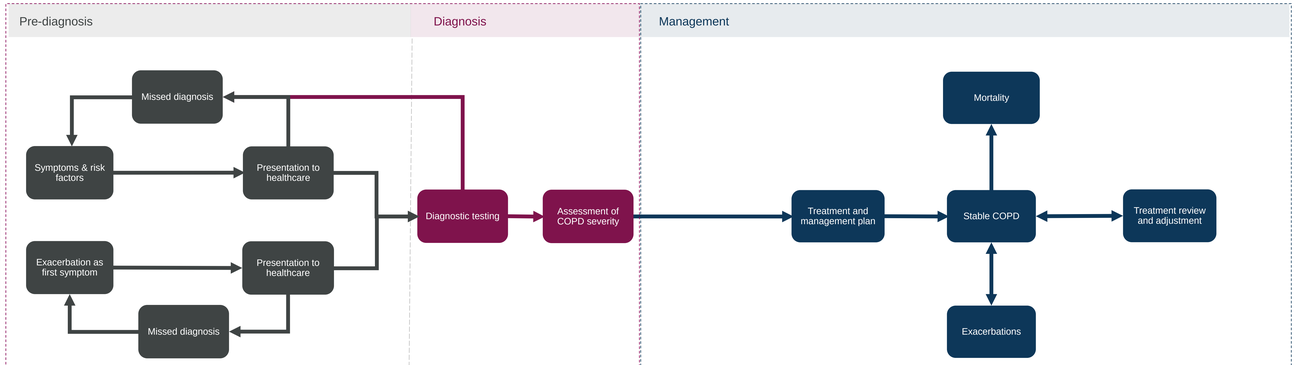
The English term 'COPD' is difficult for Japanese patients to understand – HCPs still use emphysema to describe COPD. Japanese HCPs are much less likely to use inhaled corticosteroids due to the perception of increased risk of pneumonia in their population. Lack of a generalist system in Japan allows patients to present to specialists directly.

Impact of COVID-19

- **COVID-19 has accelerated existing healthcare trends and offered opportunities for improving parts of the care pathway.**
  - **Negative** impacts: reduced access to spirometry, reduced access to pulmonary rehabilitation, patients less open about symptoms, an increased difficulty in identifying COPD, and possible misdiagnoses due to remote consultations.
  - **Positive** impacts: reduced frequency of exacerbations from fewer infections, and opportunity for remote and virtual care to increase HCP access, especially for very severe patients.

"Luckily most of our COPD patients didn't have exacerbations as you expected because of masking, social distancing and pretty much shielding has actually helped."
GP, England

Figure 1. Global overview of the clinical care pathway for patients with COPD



The journey to diagnosis: many patients remain undiagnosed or present with advanced COPD. The trigger to diagnosis is often an exacerbation.

There are barriers to optimal care along the entire diagnostic pathway. Many patients do not present to healthcare when they have symptoms and therefore cannot be diagnosed; often, even if they do present, many do not obtain a final COPD diagnosis confirmed by good-quality spirometry.

Low consideration of COPD by patients (HCP reported)

Patients do not present to healthcare as they either do not recognise that their symptoms are indicative of COPD (e.g., breathlessness is thought to be due to aging), or are reluctant to present to healthcare (e.g., due to the smoking stigma associated with COPD or poor awareness leading them to think COPD is untreatable).

"They think it's due to ageing, they don't complain to GP, their family doctors…and the symptoms are very, huge symptoms, very, in other words very later stage of the disease. They came to the chest physicians."
Respiratory specialist, Japan

Low consideration of COPD by HCPs

There is a broader lack of interest in respiratory diseases especially in primary care, indicated by a lack of respiratory-specialised HCPs (doctors and nurses). Some GPs do not recognise or identify COPD due to poor awareness and training; they may not know that the COPD disease path can be modified, therefore may not understand prompt diagnosis and proper management is important. This lack of interest and awareness has led to COPD being seen by HCPs as a lesser priority compared to other chronic conditions such as diabetes and heart disease.

"We still haven't found a way, okay, to bring the physician to understand the importance of this disease that the treatment and management has changed. You can really make a difference with the treatment pharmacology and non-pharmacology in terms of the patient's life, in terms of preventing exacerbation"
Respiratory specialist, Canada

Spirometry, the main diagnostic tool, is underutilised although there are nuances by country

Poor quality and interpretation of spirometry was identified by HCPs as a major barrier to diagnosing patients with COPD. Globally, HCPs believed that poor training was a major factor, time constraints and lack of financial incentives were also mentioned. Dedicated diagnostic hubs or spirometry nurses who regularly perform spirometry in high volumes (similar to x-rays) would improve this.

"There's the act of doing high-quality spirometry and there's then the interpretation of the subsequent thing. Then you've got your equipment, whether or not GP practice has paid for adequate equipment, whether or not it's actually been calibrated recently"
Respiratory specialist, England

Misdiagnosis due to poor quality diagnosis

Even for specialists, COPD is difficult to differentiate from asthma, viral infections or heart disease because the presenting symptoms such as cough and breathlessness are similar.

"So, there's a huge gap of patients who are either not diagnosed or misdiagnosed with bronchitis or with asthma and are only being seen in GP practices, this is the real flaw …They are there and they need to be found."
Respiratory specialist, Germany

Sub-optimal acute and chronic disease management among non-specialists is common; available treatment options are not fully used.

Following diagnosis, patients are often managed with sub-optimal pharmacological and non-pharmacological treatments, which can lead to poorer health related quality of life and faster disease progression, which generates a higher burden on healthcare services at a greater cost.

Non-pharmacological treatments are underutilised

Non-pharmacological treatments, particularly smoking cessation and pulmonary rehabilitation, are important but limited in their availability and challenges exist in administering them.

Patients' lack of understanding around the importance of physical activity, long waiting lists, and limited availability and capacity of facilities providing pulmonary rehabilitation can hamper access to these services.

Uptake of smoking cessation services may be hindered by low patient motivation, wide variation in the type and effectiveness of smoking interventions offered, and time available to HCPs to provide smoking cessation counselling.

"Well, there are several issues or problems. One problem is the, let's say, the situation that you don't offer structured smoking cessation programmes, pulmonary rehab, all these non-pharmacological treatments aspects, which are really important clinically, absolutely meaningful."
Respiratory specialist, Germany

Pharmacological treatment is often inadequate or inappropriate

HCPs noted that regular inhaler technique assessments are very important to ensure patients are educated on their particular inhalers to get the correct medication dose. Poor inhaler technique and medication adherence, especially among the elderly, can reduce the benefits of treatment.

Time constraints in HCP appointments may limit regular inhaler assessments, and lack of resources to provide training for patients, poor knowledge of available inhaler options may impact on proper inhaler use.

"So, get inhaler technique right. Again, I think a lot of clinicians aren't good at assessing inhaler technique which means a lot of patients are using their medication ineffectively."
GP, England

Exacerbations

Exacerbations are a major cause of hospitalisation. Patients are poor at recognising the symptoms and severity of exacerbations and when to present to healthcare settings, e.g. for moderate or severe exacerbations that should be treated by HCPs. Often reporting of exacerbations is delayed until the next treatment review or not reported at all (especially mild exacerbations). These actions can lead to inappropriate treatment which can worsen the disease progression and outcomes.

The use of exacerbation action plans depends on the HCP, particularly the HCP's perception of the patient's willingness and confidence to carry out the action plan. Some clinicians report that increasing the patient's confidence in being able to self-manage could lead to reductions in exacerbation duration and hospitalisations.

"My patients that have action plans, I'll tell you right now they don't even report to me to get the action plan. The next three months go by, I see them again, and still, "Have you activated your action plan?" They go, "Oh, yes. No I used my antibiotic and prednisone a couple of weeks ago," I'm, "Where's the phone call?"
Respiratory specialist, Canada

Discussion and conclusions

Discussion

- Analysis of COPD care pathways, including data from published studies and qualitative data gathered from HCP interviews, highlighted the issues currently facing COPD care across four countries, and indicated that care does not always conform to GOLD recommendations or country-specific care guidelines.
- Several common areas throughout the care pathway were identified that could have the greatest potential for improving patient care and outcomes including: the journey to diagnosis, treatment and management, and changes to management following COVID-19. These themes were persistent across the four countries despite variations in health system infrastructure.
- These challenges highlight opportunities to improve care delivery and address other broader initiatives such as raising awareness of COPD for the general population, education for HCPs around COPD and specifically through training to improve spirometry for diagnosis, and improving acute and chronic disease management using pharmacological and non-pharmacological interventions.
- Understanding current care pathways can inform policy reform at a global and national level; in particular, understanding the gaps between guidelines and/or best practice and what is happening currently can indicate where change is needed.
- Using evidence from these pathways, future modelling work could explore the long-term health outcomes and financial impact of policy changes in these four countries.

Limitations

- This study relied on published data and on insight from clinicians recruited for interviews; while we sought a broad range of HCPs, they may not represent the full spectrum of care in each country. In particular, participating HCPs may have a special interest in COPD and therefore be more aware of the issues compared to other clinicians, especially those in primary care.
- Most of the HCPs were based in urban practices and may not reflect healthcare in rural areas; there may be differences in pathways not captured in the interviews.
- While we used experienced interpreters during interviews, using translated transcripts for data analysis carries the risk that phrases/ideas do not reflect their actual meaning.

Conclusions

- COPD is an important public health issue that needs urgent prioritisation to reduce exacerbations and mortality, especially in light of the additional challenges of COVID-19.
- Developing detailed care pathways for COPD diagnosis and management can highlight the gap between guidelines and how care is currently delivered, which can support interventions and policies to improve care and outcomes for patients and reduce resource use and cost for the healthcare provider/payer.

Disclosures

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References

1. Global Initiative for Chronic Obstructive Lung Disease. Global strategy for diagnosis, management and prevention of COPD. 2021.
2. WHO. Chronic obstructive pulmonary disease (COPD) fact sheet. 2021
3. Adeloye D, Chua S, Lee C, et al. Global and regional estimates of COPD prevalence: Systematic review and meta–analysis. J Glob Health. 2015;5(2):020415.
4. Bloom, D.E, Cafiero, E.T, Jané-Llopis, E, et al. The Global Economic Burden of Noncommunicable Diseases. Geneva: World Economic Forum. 2011

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