**Supplementary Materials**

Section A: Introduction

1. Please provide an overview of your background, and whether you are able to discuss national contexts in addition to perspectives on your centre

Section B: People

1. For pulmonology/thoracic surgery/radiation oncology do you have requisite Training and Competency for practice assurances?
2. If required, can all patients receive multidisciplinary cancer conference (MCC) including medical and radiation oncologists, pathologists, radiologist and surgeons?

Section C: Process

1. Are the decisions of operability and resectability made by a surgeon or in a multidisciplinary round? 2. For patients deemed unsuitable for surgery, are they assessed for radiation, and who is their eligibility defined by?
2. Is care integrated within established networks to ensure appropriate care is provided closer to home?
3. Are there mitigating programmes in place for vulnerable populations (geography, social determinants of health etc)?
4. In your opinion, what are the main drivers and barriers in deciding upon treatment choice for early stage patients?

Section D: Structure of services

1. Is thoracic surgery and radiation oncology regionalised with set standards on case volume and supporting services?
2. Are pathology services timely with quality assurance (e.g. synoptic reporting)?
3. Do you have comprehensive and timely access to diagnostics so that all testing (e.g. PET scan, CT, percutaneous biopsies, bronchoscopy and EBUS, cranial imaging etc.) can be completed within defined wait times for cancers? a. Is there any variation in the availability of PET scanning?

Section E: Quality

1. Are wait times monitored to assure timely access to care?
2. Is infrastructure in place to support participation in clinical research for all patients?
3. Is routine data collection on process and outcomes systematically and prospectively captured? Is this benchmarked against national and international standards in a risk adjusted manner?
4. Do you have data for your centre on case volumes, numbers of practitioners and proportions of treatment decisions for stage I and II NSCLC patients? If so, are you able to share this with us or give an indication of numbers?

**1. Key Informant Interview Questions**

**2. Summary of key informant interview findings**

| ICBP Country | People | Process | Structure | Quality |
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| Australia | **Training & competency:** Fellowship programme prior to specialist training programmes; national bodies introducing credentialing for procedures<br>**MDT:** Exist for every tumour site but composition varies between specialities and states; challenges with private patients presented at public MDTs<br>**Additional:** Movement between private/public sectors, usually based on patient choice | **Eligibility decisions:** Surgeons lead decision on operability; radiation oncologist specialised in SBRT/SABR rather than general RO spanning various tumour sites<br>**Mitigating programmes:** Royal flying doctors service to fly patients in from very rural areas; improvements in telehealth<br>**Main drivers:** Well established pathways for urgent referrals; established MDTs; lung cancer centres of expertise<br>**Main barriers:** Geography – very rural areas; social determinants and stigmatism of lung cancer; comorbidities | **Service structure:** Public system has undergone significant regionalisation<br>**Access to diagnostics:** PET well established across the country – quick and easy access; CT scans done in the community; bundle of CT, lung function, PET, EBUS prior to seeing surgeon<br>**Screening:** Due to abundance of scanning access/activity, can perform opportunistic screening; pilots ongoing | **Wait times:** Collect all MDT data and audit times to care delivery (not universal across Australia); Wait times tracked and time points identified that are expected<br>**Clinical research:** Exists in both private and public; suitability and availability discussed in MDTs; restrictions exist due to funding<br>**Data collection:** No access to data in private system, have to physically contact private care providers to request; no national registry, state based registries exist; not able to look at outcomes systematically as no infrastructure to gather data prospectively |
| Canada | **Training & Competency:** Radiation Oncology (RO)– dedicated subspeciality training programme<br>**MDT:** 5-10% patients discussed at MDT; varies between provinces; surgeons receive compensation to participate; process very time consuming, not feasible in Canadian system to discuss all patients<br>**Additional:** Referrals triaged at cancer centre level, then | **Eligibility decisions:** Surgeons make operability decisions, radiation oncologists consulted when patients deemed inoperable<br>**Mitigating programmes:** More needs to be done to reach vulnerable populations<br>**Main drivers:** Ability to disseminate new advanced techniques quickly in certain provinces<br>**Main barriers:** Accessibility and cultural barriers | **Service structure:** Need more structured regionalised care – diagnostic assessment programmes help<br>**Access to diagnostics:** Issues with timely access particularly in rural communities<br>**Screening:** Pilot studies underway | **Wait times:** Evaluated on wait times; benchmark of 2 weeks from consult to treat<br>**Clinical research:** Put on hold due to COVID; resource and availability issues prior to COVID<br>**Data collection:** RO – benchmarking done when actively looking at it, no mandate to keep and evaluate data |

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| | secondary referral on to RO or surgeon | | | |
| Denmark | **Training & Competency:** Training programmes managed by 4 centralised departments; learn by doing for novel techniques<br>**MDT:** All disciplines involved, and every lung cancer case seen | **Eligibility decisions:** Surgeons decide upon operability; differences between regions likely due to differences in decision upon best treatment<br>**Mitigating programmes:** National programme of follow up and national programme of rehabilitation and physical training<br>**Main drivers:** Increased access to CT, good online data repository with integrated benchmarking<br>**Main barriers:** Social inequalities | **Service structure:** 4 centralised surgical departments, no centres performing less than 150 surgeries a year<br>**Access to diagnostics:** Much better access to diagnostics and PET-CT (seen stage migration over last 10 years driven by this)<br>**Screening:** No formal programme in place; some at risk groups targeted | **Wait times:** Patient course programme with number of maximum days allowed between each procedure; uses coded system monitored by national health organisation; target of 85%; not encored but publicised and justification required for patients not meeting target to Bord of Directors<br>**Data collection:** Online data repository where results are benchmarked across country; clinicians supplement and validate data collected from central registries; data completeness now around 100%; annual reports published |
| England | **Training & Competency:** Robust licensing process, focus on competency; more training needed for novel procedures<br>**MDT:** Variation between peripheral and central centres; all patients should be discussed prior to treatment; MDT streamlining project in process<br>**Additional:** Diagnostic standard of care introduced to bundle diagnostic tests and mean only 1 MDT is required (reduce delays) | **Eligibility decisions:** Partly driven by expertise and variation in hospitals/centres with thoracic surgical units<br>**Mitigating programmes:** Targeted lung health checks<br>**Main drivers:** MDTs help upskill; improvements in accuracy of diagnostic and staging tools; better surgical techniques<br>**Main barriers:** Low CT scanner per population; capacity of services | **Service structure:** Marked differences in treatment rates in bigger centres compared to peripheral hospitals; drive to push more capacity of ablative radiotherapy services within centralisation plans<br>**Access to diagnostics:** Rapid diagnostic centres for nonspecific symptoms picking up late stage disease; responsiveness of PET services variable across country | **Wait times:** set wait time targets<br>**Clinical research:** Difficult to embed in clinical pathways as many services are busy; better in oncology as research nurses exist to support<br>**Data collection:** set criteria with service specification but recommendations and capture not universal across specialities; good capture and monitoring but impediments in delivering change following analysis/reflection; national audit effective but may be losing detail of data by covering too much |

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| | | | **Screening:** National screening committee reviewing the cost effectiveness of targeted programme driven by lung health checks work | |
| Ireland | **Training & Competency:** Fellowship programme; still large number of cardiothoracic surgeons in lung cancer<br>**MDT:** Half patients put forward for MDTs; radiology involvement recognised as important but not in formal workplan; at discretion of physician if patient is listed for MDT<br>**Additional:** Approx. half of people in Ireland have private healthcare | **Eligibility decisions:** Typically, surgeon's decision; fitness of patient always considered<br>**Mitigating programmes:** Ambulatory chest clinics; virtual consultation as a solution to geography/travel challenges<br>**Main barriers:** No uniform service set up; difficulties in instigating change – needs to be led centrally; fee for service can be a barrier | **Service structure:** 4 thoracic surgery units with no specification on number of lobectomies<br>**Access to diagnostics:** Access varies between hospitals; some services outsourced to private sector due to COVID, 8 rapid access lung clinics<br>**Screening:** No formal programme in place; national screening committee created | **Wait times:** No strict monitoring, supposed to be 80% compliant – may get notification of breaking 80% but wouldn't be told where the problem is<br>**Clinical research:** ICORG run by oncologists to support local clinical trials units in hospitals; challenges with staffing and patient recruitment<br>**Data collection:** some quality performance indicators but no penalties or incentives to be compliant; some local database collection/management; annual meeting to compare data but not analysed further; no funds or capacity to perform an audit |
| New Zealand | **Training & Competency:** Royal Australasian College of Physicians responsible for accreditation of training<br>**MDT:** All appropriate disciplines attend; encouragement for more than 1 of each discipline to attend; national standard is 100% patients discussed | **Eligibility decisions:** Surgeons receptive so fairly easy access to surgery; variation in surgical resection rates<br>**Mitigating programmes:** Major disparities with Maori and Pacific populations and rural vs metropolitan areas – no national guidance, regions decide upon initiatives | **Service structure:** Centralised labs with synoptic reporting<br>**Access to diagnostics:** Generally good access to PET but variable across the country, particularly with rural areas; PET services run efficiently as provided through private sector; more | **Wait times:** National pathways tool monitored centrally from receipt of referral to receipt of treatment; patients to be seen within 2 weeks from receipt of referral; total cancer wait target of 62 days<br>**Clinical research:** Difficulties in engaging pharmaceutical companies; lack of research but it is improving – often the only chance patients can |

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| | | **Main drivers:** New quality performance indicators will support quality improvement programmes<br>**Main barriers:** Poor access to immunotherapy as no public funding; late diagnoses, approx. 40% cases incidental diagnoses | funding needed to develop in rural areas<br>**Screening:** No formal programme in place; being explored as mentioned in latest strategy; pilots ongoing in Indigenous populations | receive immunotherapy<br>**Data collection:** No national lung cancer database/reporting and no central collection of staging data; no national audit, regional audits measured against national standards; national cancer registry based mostly off pathology and discharge reports and death certificates |
| Northern Ireland | **Training & Competency:** Accreditation via fellowship programmes; maintenance of certification process via reflective practice reviews<br>**MDT:** Preference of representation at MDTs drives variation in treatment; every patient discussed | **Eligibility decisions:** Ultimate decision made by surgeon or RO who sees patient; comorbidities and patient fitness driver in decisions<br>**Mitigating programmes:** Hospital transport services for treatments; lung cancer nurses to support patients and administrative trackers<br>**Main barriers:** Fitness of patients; fatalism associated with disease; more oncologists needed to support current system | **Service structure:** 1 large surgical centre, 1 large radiotherapy centre, 2 chemotherapy centres and some satellite units; variability in case volumes<br>**Access to diagnostics:** Patchy access to EBUS and PET; PET scan to be done within 42 days<br>**Screening:** No formal programme in place, some pilot work | **Wait times:** 31 and 62 day targets; missed targets discussed in hospitals/Trusts but learning tends to be focused on individual cases not systemic problems<br>**Clinical research:** Mostly oncology trials<br>**Data collection:** No routine data capture; tends to be analysed within teams; information system legal framework different in NI compared to rest of UK so difficulties in transferring data to UK wide analyses |
| Scotland | **Training & Competency:** Lung cancer not a dedicated speciality; Cardiothoracic surgical training provided as Scottish wide programme<br>**MDT:** All relevant specialisms in reliable attendance; all patients discussed including deceased; no professional MDT management solution | **Eligibility decisions:** Bias tends to be towards surgery, driven by surgeons but oncologists in agreement; variability in MDT decision processes on eligibility<br>**Mitigating programmes:** No processes for extremely vulnerable; virtual clinics to streamline low risk referrals helping with reducing obstacles to | **Service structure:** Previously rigid structures, changed following COVID; service development driven by 'end of year' money – led to regional EBUS courses<br>**Access to diagnostics:** CT at point of referral; fast track clinics established 2007 (bundling of diagnostic | **Wait times:** Limit of 10 days from request to report for PET-CT; equality in wait times not included in quality performance indicators<br>**Clinical research:** Medical oncology trials usually discussed in MDTs but very small proportion of patients participating; mostly oncology trials<br>**Data collection:** Scotland in UK national lung cancer audit; need |

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| | **Additional:** Variation between different health boards, centres etc | presentation<br>**Main drivers:** Improvements in data helping drive change; increasing access to diagnostics<br>**Main barriers:** More rural areas have issues with longer timelines and worse access to diagnostics; disease stigmatism and attitude; lack of funding a barrier in improving services | tests); variation exists in access to high quality staging<br>**Screening:** No formal programme in place, pilots ongoing | analytical capacity locally and more detailed quality performance indicators; plan to have dashboard for regional performance with rolling survival data within Information Services Scotland |
| Wales | **Training & Competency:** Cardiothoracic surgery training programme; fellowship required and intercollegiate examinations defining standard clinical competencies<br>**MDT:** Every patient discussed, even if deceased | **Eligibility decisions:** More likely to receive surgery closer to thoracic centres (may influence how aggressively treatment decisions are pushed); designated lung cancer physicians in each heath board leading services; eligibility generally led by surgeons<br>**Mitigating programmes:** Specialist nurses assigned to help in diagnostic pathway (transport arrangements, emotional support, patient advocate); clerical cancer services staff to help with patient tracking; patient transport services<br>**Main drivers:** Optimal pathways will streamline pathway for patients<br>**Main barriers:** Variability in patient speed through diagnostic services; borderline patients needing fast diagnosis and treatment to keep within curative stage; access to | **Service structure:** 2 centres in Wales (planning to become 1); North Wales served by Liverpool thoracic centre; 2 radiation centres in Wales (only 1 does SBRT)<br>**Access to diagnostics:** Improved turnaround times since new PET centre set up; access to other diagnostics improved (e.g., EBUS) but more improvement needed to hit targets; national optimal lung cancer pathways bundle tests but issues arising with delivering tests in right timeframe (particularly histology)<br>**Screening:** No formal programme in place | **Wait times:** Tracked but need dashboard to track average time of reporting; try to proactively intervene; need a central body to be in control of audit-feedback loop and monitoring<br>**Clinical research:** Have targets for clinical trials; eligibility considered at MDTs once treatment decided; many trials need histopathology processed but more workforce needed to support this; COVID stopped trials<br>**Data collection:** Patients coming in via emergency presentation not captured in official cancer statistics; use UK national lung cancer audit which helps drive improvement; outlier Trusts on core metrics will be informed – Chief Executive of hospital receives letter if more than 3SD away; Chief Executive required to write a letter to health minister for every patient missing targets |

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| | | diagnostics in more rural areas | | |