

Diagnostic technologies

Technologies play an important role in medical diagnoses: from physical examination and results processing and sharing, to accessing patients' health records, to the review of clinical histories. However, new technologies are acknowledged as a major cost driver in health systems (Lorenzoni et al., 2019^[1]). This section presents data on the availability and use of three diagnostic imaging technologies: computed tomography (CT), magnetic resonance imaging (MRI) and positron emission tomography (PET). CT and MRI examinations (exams) both show images of internal organs and tissues, while PET scans show other information and problems at the cellular level.

There is no general guideline or international benchmark regarding the ideal numbers of CT scanners, PET scanners or MRI units. Too few units may lead to access problems in terms of geographical proximity or waiting times, while too many may result in overuse of these costly diagnostic procedures, with little if any benefit for patients.

Availability of CT and PET scanners and MRI units has increased rapidly in most OECD countries over the past few decades. Japan had by far the highest number of CT scanners and MRI units, and the third highest number of PET scanners per capita. Australia had the next highest number of CT scanners; the United States the second highest numbers of MRI units and PET scanners; and Denmark the highest number of PET scanners per capita (Figure 5.23). The combined numbers of these three diagnostic technologies were also substantially higher than the OECD average in Korea, Greece, Italy and Germany; and much lower than average in Costa Rica, Colombia and Mexico.

Data on the use of diagnostic scanners are available for 30 OECD countries. Taken together, the use of CT, MRI and PET diagnostic scanners was highest in the United States, Luxembourg, Korea, France and Austria, all of which had a combined total of over 360 exams per 1 000 population in 2021 (Figure 5.24). The use of these three diagnostic exams was lowest in Costa Rica and Chile; and also in OECD accession countries Romania and Bulgaria. There are large variations in the use of CT scanners and MRI units, not only across but also within countries – for example, in Belgium, recent analysis showed a 50% variation in use of diagnostic exams of the spine across provinces in 2017, and this variation was even larger across smaller areas (INAMI/RIVIZ, 2019^[2]).

Looking at trends over time, large increases in CT and MRI exams per 1 000 population can be seen in a number of countries up to 2019 (Figure 5.25 and Figure 5.26). For example, the number of CT exams more than doubled in Korea, and the number of MRI exams more than doubled in Australia, Korea and Slovenia.

Clinical guidelines exist in several OECD countries to promote more rational use of MRI and CT exams. Through the Choosing Wisely campaign, which began in the United States in 2012 and has since been emulated in a growing number of countries, some medical societies have identified cases when

an MRI or CT exam is not necessary. For example, the Royal College of Physicians in the United Kingdom recommends, based on evidence from the National Institute for Health and Care Excellence (NICE), that patients with low back pain or suspected migraine do not routinely need an imaging test (Choosing Wisely UK, 2018^[3]).

Despite the general upward trend in the use of diagnostic technologies over time, there were drops across many OECD countries between 2019 and 2020, particularly for MRI exams. Such reductions were due to health providers being forced to delay or cancel diagnostic exams early in the COVID-19 pandemic. In the United States, the reduction was particularly large (over 30%). In 2021, however, diagnostic exams increased, and were typically above 2019 levels.

Definition and comparability

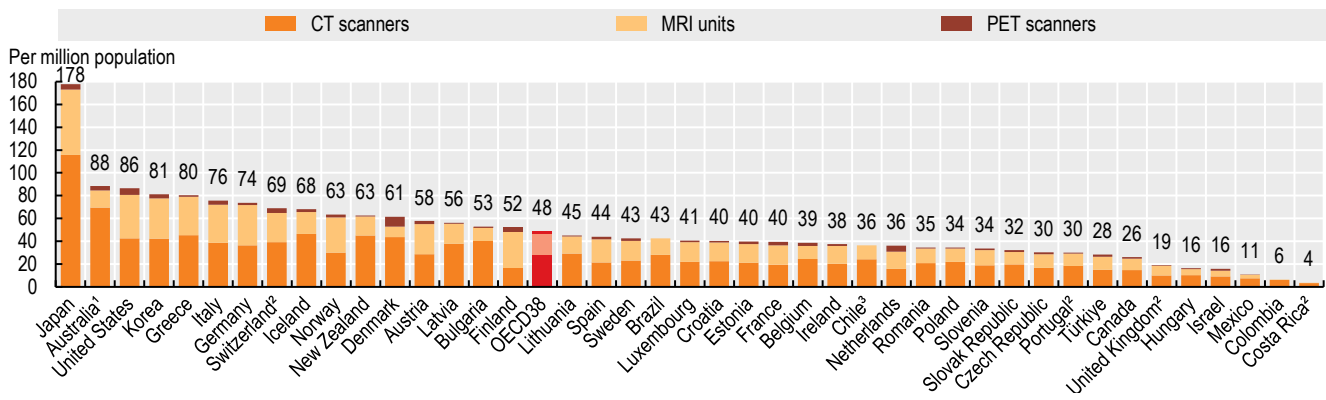
The data in most countries cover CT scanners, MRI units and PET scanners installed both in hospitals and the ambulatory sector, but coverage is more limited in some countries. Costa Rica, Portugal, Switzerland (for MRI units) and the United Kingdom report equipment available in hospitals only. For Colombia, Costa Rica and the United Kingdom, the data only cover equipment in the public sector. For Australia and Hungary, the number of CT scanners, MRI units and PET scanners includes only those eligible for public reimbursement.

Similarly, CT, MRI and PET exams performed outside hospital are not included in Portugal, Switzerland and the United Kingdom, while exams performed in hospitals are not covered in Norway. In Australia, the data only include exams for private patients (in or out of hospital), while in Korea and the Netherlands they only include publicly financed exams.

References

- Choosing Wisely UK (2018), "Clinical Recommendations: Royal College of Physicians", [3]
<http://www.choosingwisely.co.uk/>.
- INAMI/RIVIZ (2019), "Medical Practice Variations", [2]
<https://www.healthybelgium.be/en/medical-practice-variations>.
- Lorenzoni, L. et al. (2019), "Health Spending Projections to 2030: New results based on a revised OECD methodology", *OECD Health Working Papers*, No. 110, OECD Publishing, Paris, [1]
<https://doi.org/10.1787/5667f23d-en>.

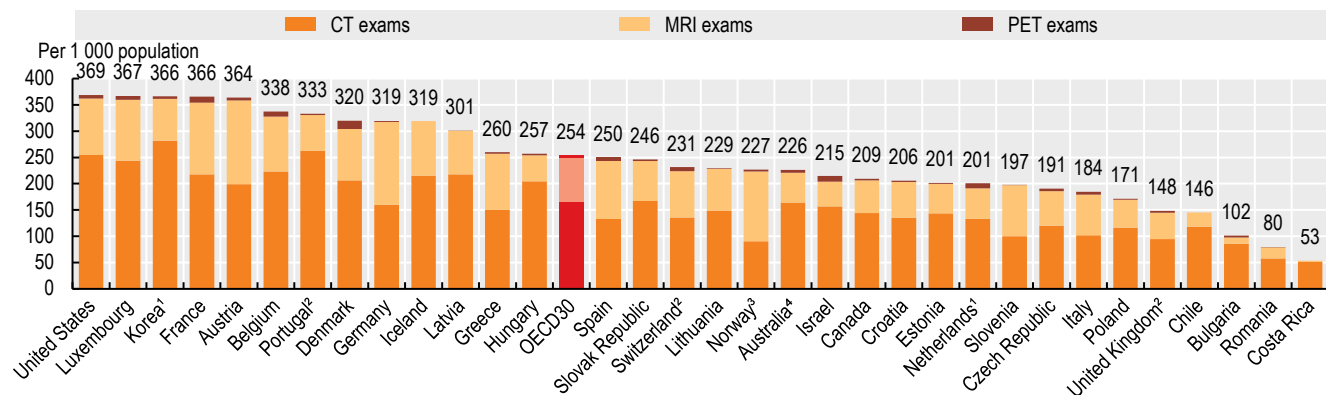
Figure 5.23. CT scanners, MRI units and PET scanners, 2021 (or nearest year)



1. Data include equipment eligible for public reimbursement only. 2. Data exclude equipment outside hospital (only for MRI units in Switzerland). 3. Data refer to 2017 only. Source: OECD Health Statistics 2023.

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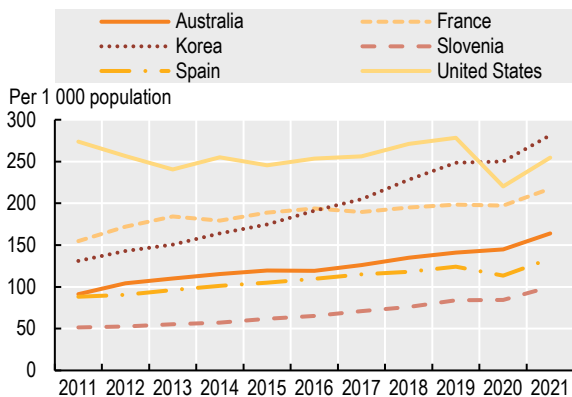
Figure 5.24. CT, MRI and PET exams, 2021 (or nearest year)



1. Data exclude privately funded exams. 2. Data exclude exams outside hospital. 3. Data include only exams outside hospital. 4. Data exclude exams on public patients. Source: OECD Health Statistics 2023.

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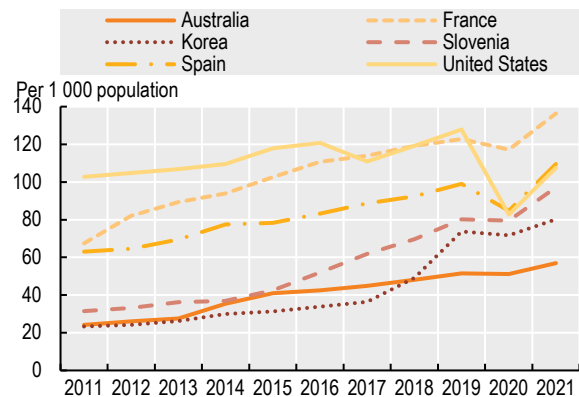
Figure 5.25. Trends in CT exams, selected countries, 2011-21



Source: OECD Health Statistics 2023.

StatLink <https://stat.link/nvtg0x>

Figure 5.26. Trends in MRI exams, selected countries, 2011-21



Source: OECD Health Statistics 2023.

StatLink <https://stat.link/a34xp9>



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