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Radiology market - X-ray Systems & Mammography Devices

Market trends | Overview

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Agenda

- Market segmentation, size, dynamics and drivers
- Major market trends, key entry barriers and inhibitors
- Competitive environment

X-ray Systems and Mammography markets segmentation by type/technology, end-user and geography

Radiology market segmentation

- **Medical Devices**
  - **Diagnostic imaging**
    - **Radiology Market**
      - **X-ray Systems**
        - **Type**
          - Adjustable
          - Mobile[1]
        - **End user**
          - Hospitals
          - Clinics
          - Others
        - **Geography**
          - North America
          - Europe
          - Asia
          - South America
          - Middle East & Africa
      - **Mammography Devices**
        - **Type**
          - Digital
          - Analog
        - **End user**
          - Hospitals
          - Clinics
          - Others
        - **Geography**
          - North America
          - Europe
          - Asia
          - South America
          - Middle East & Africa

Notes: (1) include C-Arm machines and X- Ray mobiles
Source: PwC analysis, Fitch Solution, OECD Health Statistics 2022, WHO, Future market insights, Statista

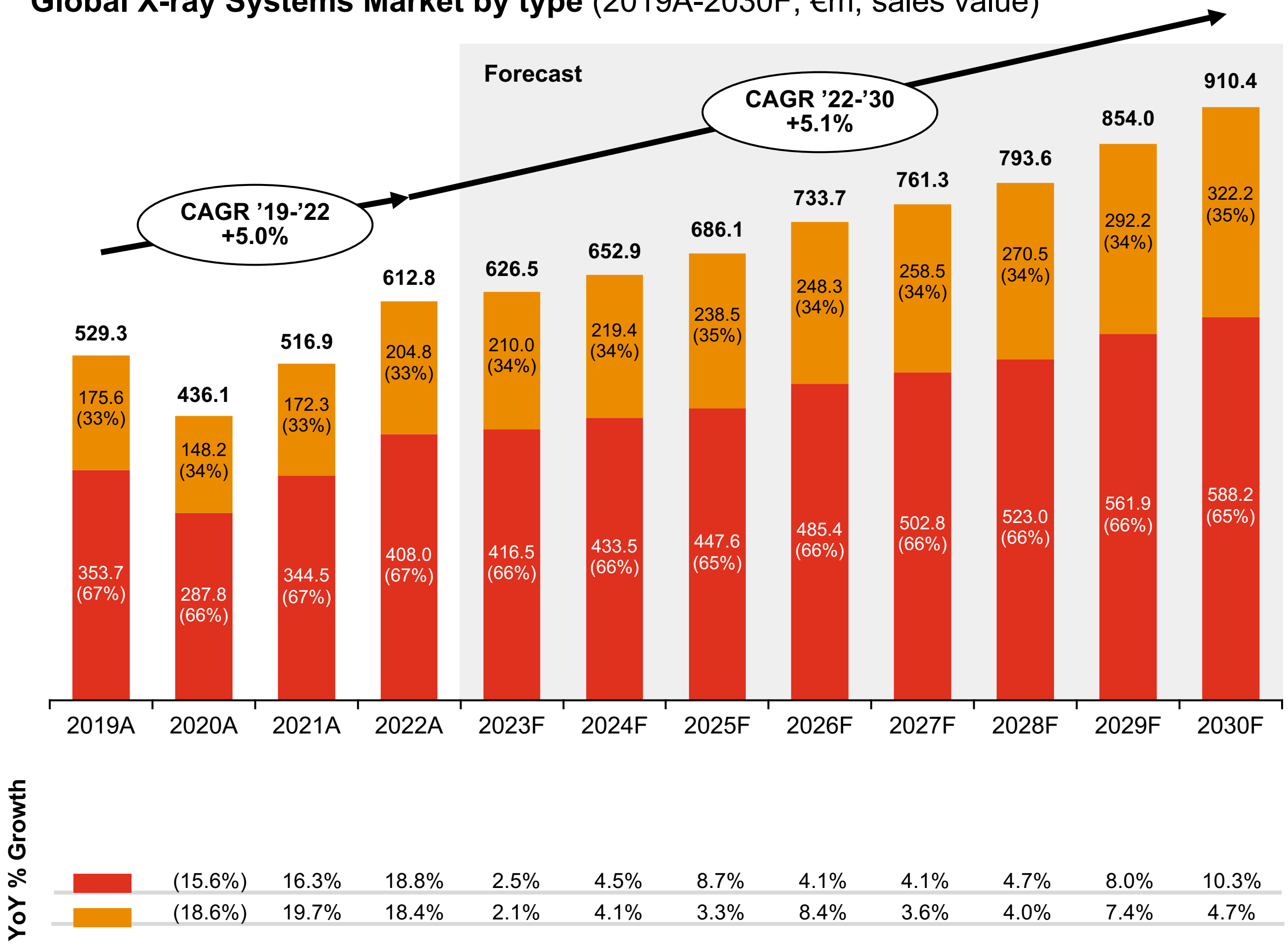
Market segmentation, size, dynamics and drivers

X-ray Systems

Sales Value (€m)

Global X-ray Systems market is forecasted to grow at a CAGR '22-'30 of 5.1%, mainly driven by replacement of obsolescent machines, increased technology and higher demand from emerging countries

Global X-ray Systems Market by type (2019A-2030F; €m; sales value)



	CAGR '19-'22 (%)	CAGR '22-'30 (%)
Mobile	5.3%	5.8%
Adjustable	4.9%	4.7%

Mobile: refers to X-ray systems that are **easily moved** or **transported** within a healthcare facility (e.g. with wheels or casters for mobility, allowing them to be quickly relocated to different rooms or imaging areas as needed)

Adjustable: refers to systems with **adjustable height**, **tilt**, or other features to accommodate different patient positions or imaging needs

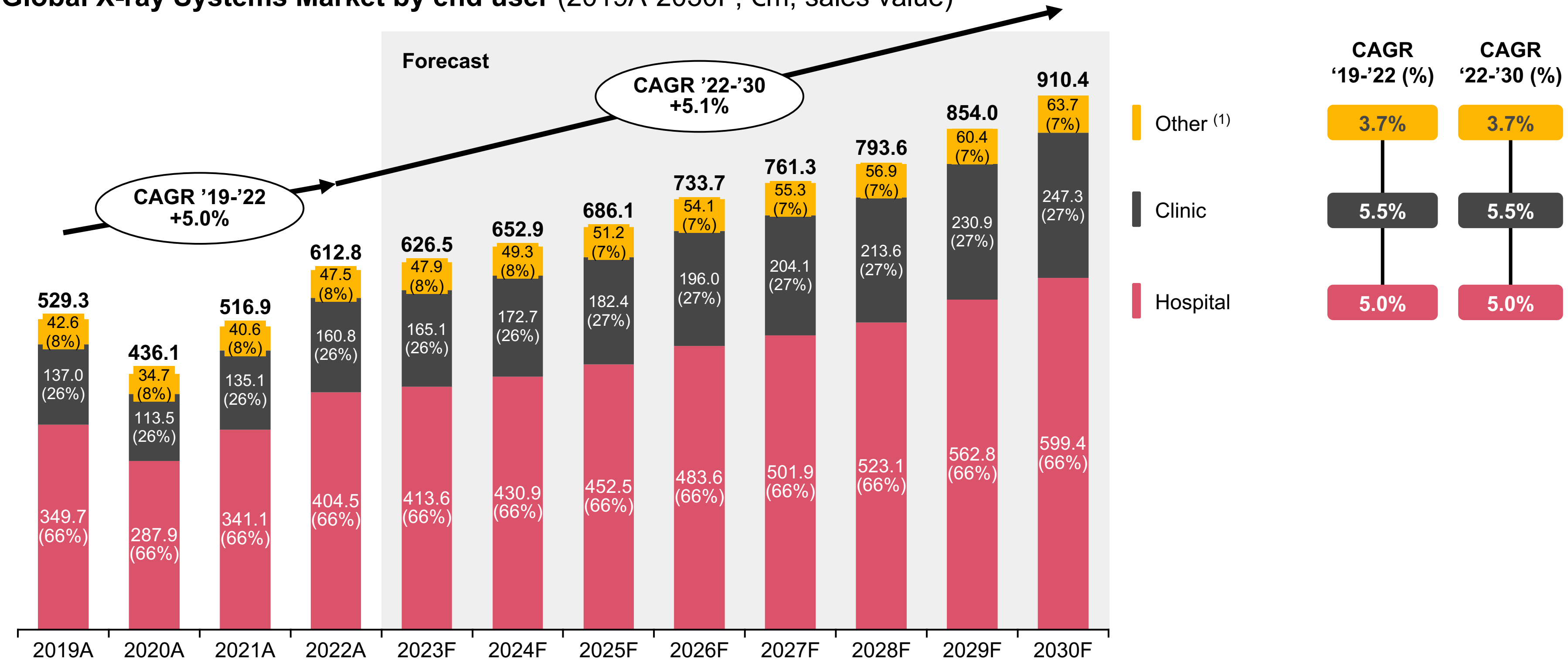
Key Notes

- Forecast overall X-ray systems market growth (CAGR 22-30 +5.1%) is mainly due to obsolescence replacement rate, increased technology applied to machinery and higher demand expected from emerging countries
- Mobile X-ray systems are expected to grow with the highest rate (CAGR 22-30 5.8%), mainly due to the ageing population and the prevalence of chronic and acute diseases, which necessitate a device that can easily adapt to the reduced mobility of patients, that can be moved to different rooms
- Adjustable systems have a market share of 65% in 2022 and are assumed to remain approx. stable until 2030 with a grow rate aligned to the past (CAGR 22-30 +4.7%). They have a wide range of uses and flexibility that allow them to adapt to weight, height, with motorized adjustment.

Source: PwC analysis, Fitch Solution, OECD (Organization for Economic Cooperation and Development) Health Statistics 2022, WHO (World Health Organization), Future market insights, Statista, Maia Research Analysis

X-ray Systems players mainly serve hospitals, but is gradually increasing the number of clinics

Global X-ray Systems Market by end user (2019A-2030F; €m; sales value)



YoY % Growth

	(18.6%)	17.1%	16.9%	0.8%	2.9%	3.9%	5.6%	2.3%	2.8%	6.3%	5.4%
	(17.2%)	19.1%	19.0%	2.7%	4.6%	5.6%	7.4%	4.2%	4.7%	8.1%	7.1%
	(17.7%)	18.5%	18.6%	2.2%	4.2%	5.0%	6.9%	3.8%	4.2%	7.6%	3.5%

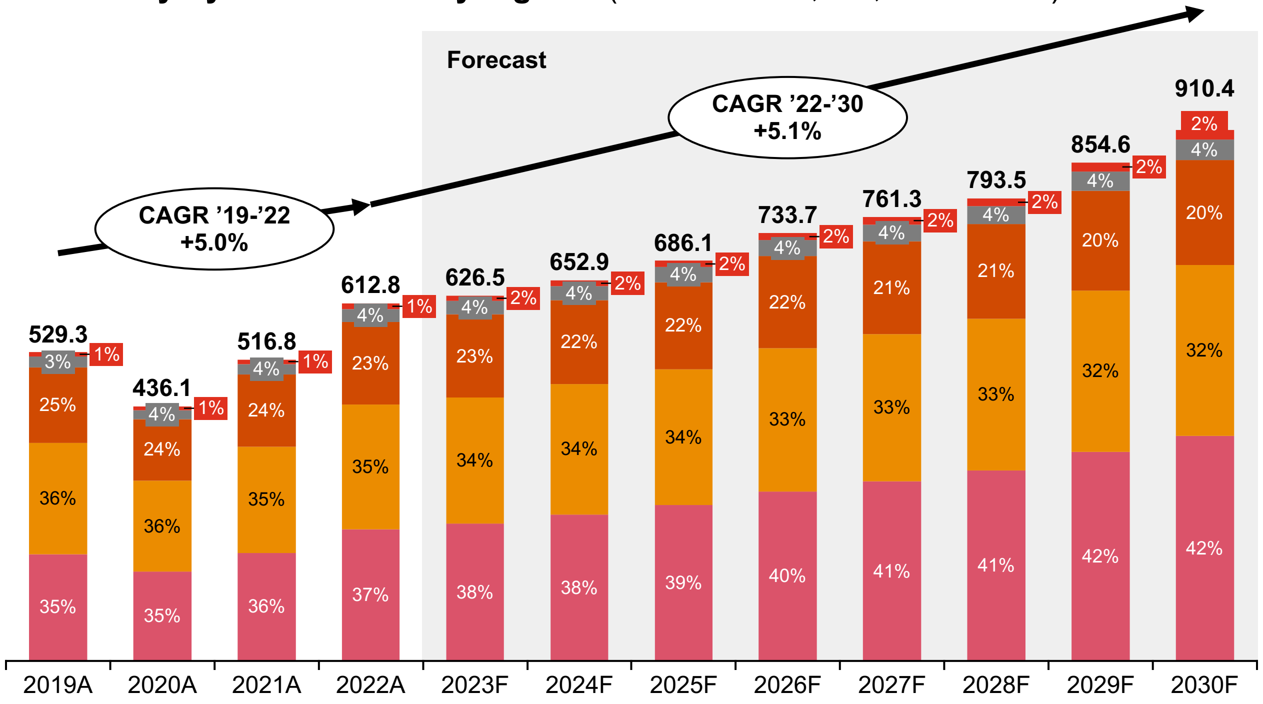
Key Notes

- The hospital category has a market share of ca. 66%, due to the quantity and size of hospitals compared to private and other categories (including veterinary clinics); its growth is forecasted to remain the same in the period 2022-2030 with a CAGR of +5.0%
- The clinic segment has ca. 27% of the total share and shows a higher growth both historically (5.5% CAGR 22-30) and forecast (5.5% CAGR 22-30), primarily driven by (i) short waiting lists in private facilities for diagnostic examinations, (ii) freedom to choose their doctors and healthcare providers and (iii) more comfortable and private environment compared to crowded public healthcare facilities

Notes: (1) "Other" segment include veterinary hospitals, veterinary clinics etc.
Source: PwC analysis, Fitch Solution, OECD (Organization for Economic Cooperation and Development) Health Statistics 2022, WHO (World Health Organization), Future market insights, Statista, Maia Research Analysis

Emerging countries drive the highest growth of the X-ray Systems market, with an expected CAGR ’22-’30 between 6.2% and 7.7%

Global X-ray Systems Market by regions (2019A-2030F; €m; sales value)



	CAGR ‘19-’22 (%)	CAGR ‘22-’30 (%)
Middle East and Africa	7.4%	7.7%
South America	6.0%	6.2%
North America	3.1%	3.0%
Europe	3.9%	4.0%
Asia Pacific	7.2%	6.9%

YoY % Growth

	(16.3%)	22.0%	21.3%	5.0%	7.5%	6.8%	10.1%	6.1%	7.1%	10.9%	8.3%
	(16.9%)	19.6%	19.7%	3.4%	5.7%	6.0%	7.9%	4.8%	5.4%	10.9%	5.7%
	(18.4%)	16.7%	15.2%	0.3%	1.2%	4.0%	5.3%	0.9%	2.2%	4.5%	5.5%
	(18.3%)	17.0%	17.3%	1.1%	3.4%	4.2%	5.5%	2.7%	3.1%	6.8%	5.7%
	(16.4%)	21.1%	21.8%	4.3%	6.5%	6.4%	8.9%	6.0%	6.0%	9.6%	7.7%

Key Notes

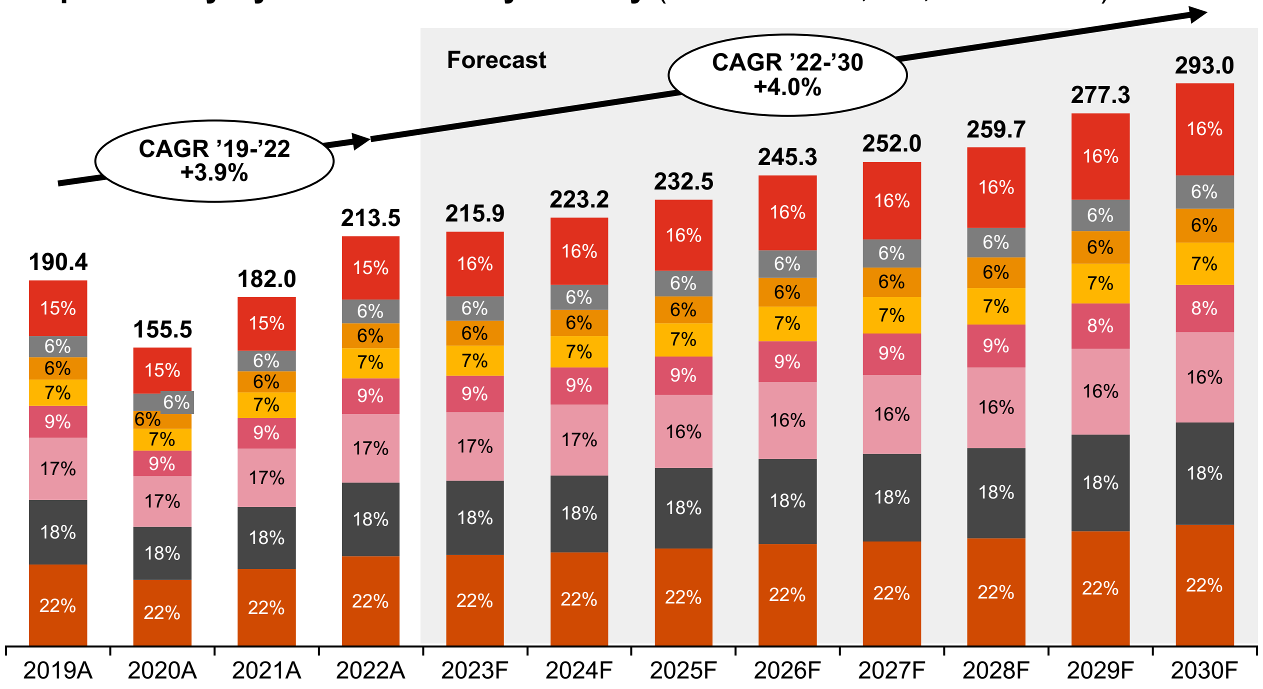
- The overall market is dominated by Asia Pacific (emerging countries), Europe (mature countries) and North America (mature countries) – with a cumulative market share of ca. 95%.
- In the forecasted period the Asia Pacific is going to growth with a CAGR 22-30 of 6.9%, mainly due to significant healthcare government program spending and efforts (such as in China and India)
- Europe, as a mature market, is assumed to have a steady but slower growth (CAGR 22-30 of 4.0% aligned to the past) mainly driven by (i) the EU4Health program (budget of €5.3b during the 2021-27 period) that will seek to reinforce healthcare crisis preparedness in the EU and (ii) replacement of obsolete machineries
- The North America market, dominated by the USA, has the lowest projected growth (CAGR 22-30 3.0%), mainly driven by machinery replacement

Source: PwC analysis, Fitch Solution, OECD (Organization for Economic Cooperation and Development) Health Statistics 2022, WHO (World Health Organization), Future market insights, Statista, Maia Research Analysis

Sales Value (€m)

The first 4 countries (UK, Germany, France and Italy) together account for more than 50% of the total European X-ray Systems market, with France shows the highest growth among them (CAGR ’22 ’30 +4.3%)

European X-ray Systems Market by country (2019A-2030F; €m; sales value)



	CAGR ‘19-’22 (%)	CAGR ‘22-’30 (%)
Others	4.4%	4.7%
Nordic Countries (1)	4.1%	4.3%
Benelux	3.9%	4.2%
Russia	4.5%	4.1%
Italy	3.7%	3.5%
United Kingdom	3.4%	3.5%
France	4.2%	4.3%
Germany	3.5%	3.8%

YoY % Growth

	2020A	2021A	2022A	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F
	(17.5%)	17.5%	17.3%	2.6%	3.7%	5.2%	5.9%	2.7%	4.5%	7.0%	6.6%
	(17.9%)	17.5%	16.9%	1.3%	3.7%	4.7%	6.0%	2.3%	3.4%	7.0%	6.3%
	(19.2%)	18.5%	17.2%	1.8%	3.8%	3.1%	6.8%	2.6%	3.7%	7.2%	4.6%
	(18.2%)	17.6%	18.4%	(0.6%)	4.6%	4.4%	6.1%	3.6%	1.3%	8.0%	5.8%
	(19.0%)	18.0%	16.7%	0.4%	2.7%	3.4%	6.5%	2.1%	2.4%	6.1%	4.9%
	(18.9%)	15.9%	17.7%	0.3%	3.0%	3.5%	4.5%	3.1%	2.3%	6.4%	5.0%
	(17.9%)	17.3%	17.4%	1.3%	3.5%	4.8%	5.8%	2.8%	3.2%	6.9%	6.3%
	(18.5%)	16.0%	17.1%	1.1%	3.1%	3.9%	4.6%	2.5%	3.0%	6.5%	5.4%

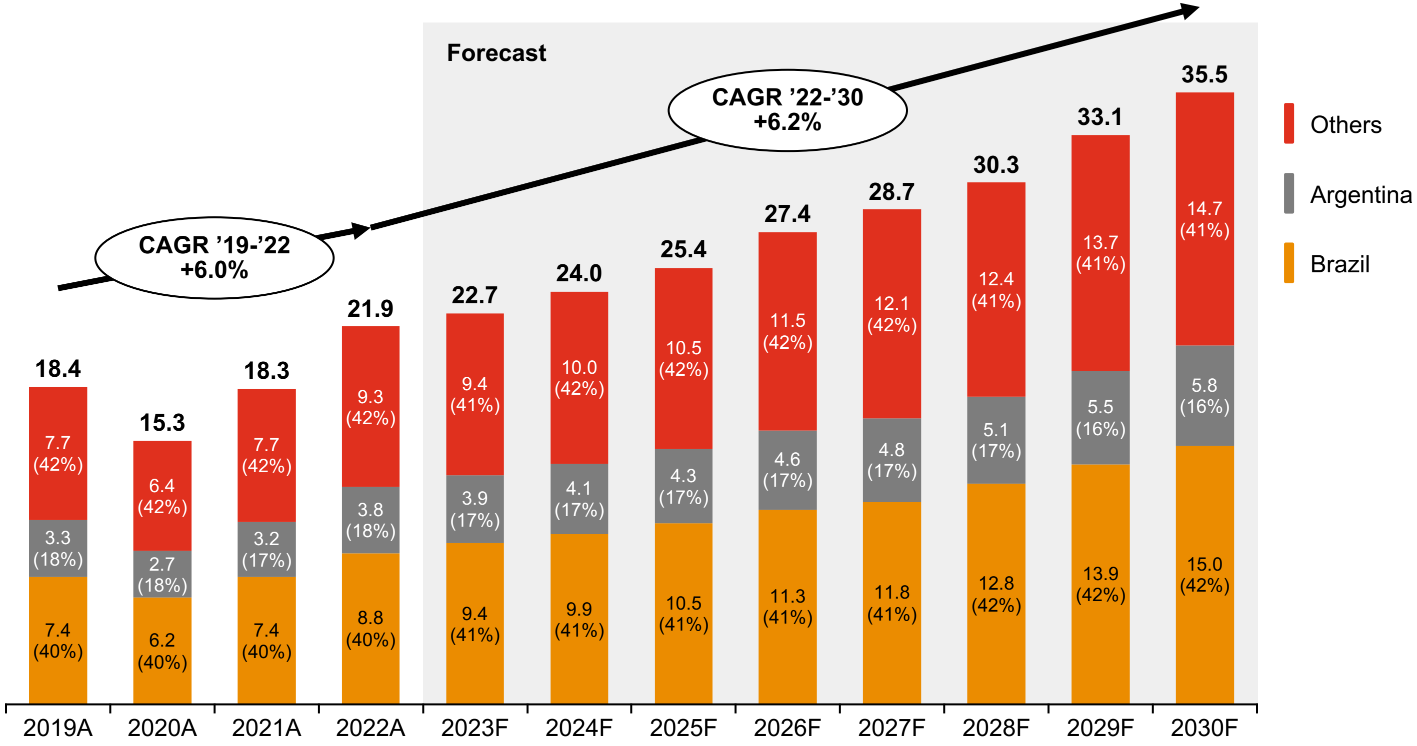
Key Notes

- In 2024, across the EU countries, ca. €752m will be granted by the EU4Health 2021-2027, in order to improve the health systems in the European Union
- In 2022, among European countries, Germany, France, UK and Italy have ca. 66% of the market shares and are forecasted to slightly reduce to ca. 64% in 2030; these countries have the lowest growth over the 2022-2030 period (respectively CAGR 22-30 of 3.8%, 4.3%, 3.5% and 3.5%)
- France's growth (4.3% CAGR 22-30) is mainly supported by government initiatives (average government health expenditure as a proportion of GDP of 10% in 2022)
- Nordic countries and Benelux have a better developed healthcare system (forecasted healthcare spending to GDP of 10.3% and 9.5% in 2022) despite their smaller market size

Notes: (1) Denmark, Finland, Iceland, Norway and Sweden
Source: PwC analysis, Fitch Solution, OECD (Organization for Economic Cooperation and Development) Health Statistics 2022, WHO (World Health Organization), Future market insights, Statista, Maia Research Analysis

South American X-ray Systems market is mainly driven by Brazil with a market share of 40% in 2022 and the highest growth (CAGR ‘22-’30 +7%)

South American X-ray Systems Market by country (2019A-2030F; €m; sales value)



	CAGR ‘19-’22 (%)	CAGR ‘22-’30 (%)
Others	6.5%	5.9%
Argentina	5.3%	5.3%
Brazil	5.8%	7.0%

YoY % Growth

	2020A	2021A	2022A	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F
Others	(16.9%)	20.6%	20.5%	0.6%	6.5%	5.5%	9.2%	5.5%	2.4%	10.1%	7.4%
Argentina	(17.6%)	17.8%	20.3%	2.5%	4.4%	5.1%	6.1%	5.4%	4.4%	8.0%	6.6%
Brazil	(16.6%)	19.5%	18.7%	6.8%	5.3%	6.4%	7.8%	3.9%	9.0%	8.7%	7.9%

Key Notes

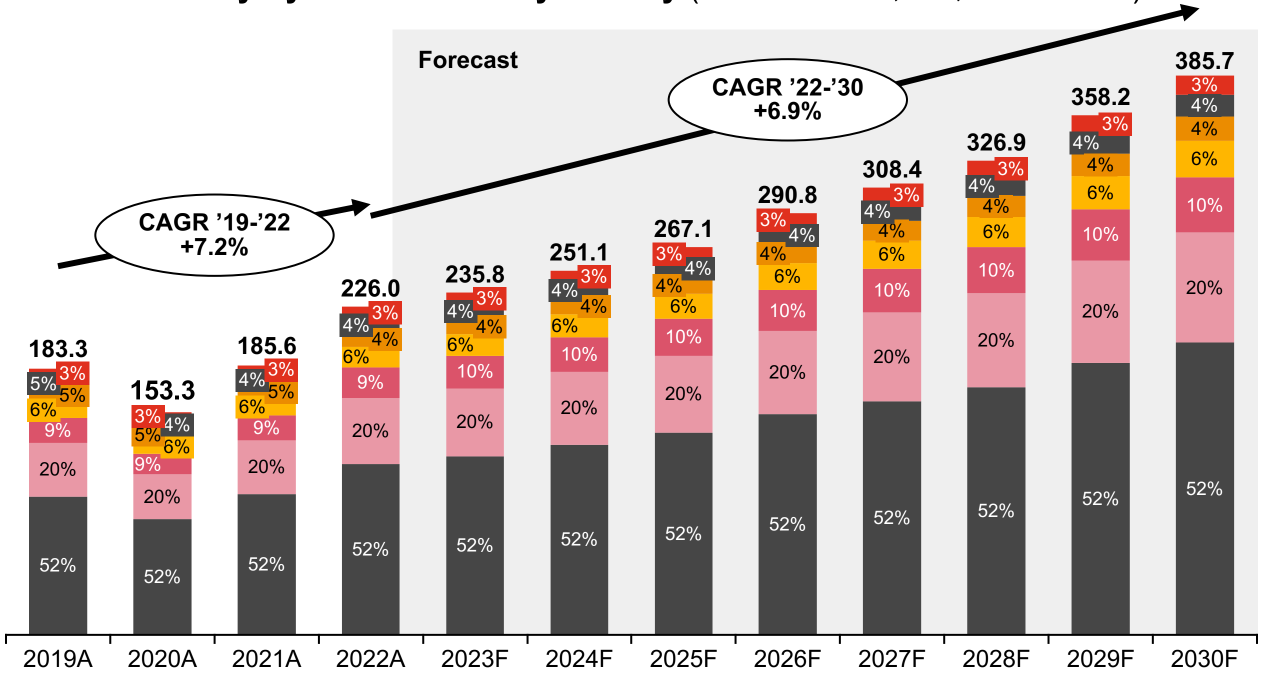
- Among the South American countries, Brazil has the highest market value (market share of 40% in 2022), and is forecasted to have the highest growth (CAGR 22-30 of 7.0%) mainly due to the high investment in healthcare (governmental healthcare spending to GDP is 9.6% in 2022)
- Despite economic challenges faced in recent years, which have affected investment in the healthcare sector, the Argentinian government recognizes the importance of investing in healthcare proven by the increase in healthcare spending from 6.0% in 2016 to 9.7% in 2022 on GDP. Therefore, Argentina is assumed to keep growing with a steady rate compared to the past (CAGR 22-30 of 5.3%)

Source: PwC analysis, Fitch Solution, OECD (Organization for Economic Cooperation and Development) Health Statistics 2022, WHO (World Health Organization), Future market insights, Statista, Maia Research Analysis

Sales Value (€m)

In the Asia Pacific region, X-ray Systems market is forecasted to grow with a CAGR 22-30 of 6.9%, mainly driven by China, India and Southeast Asia

Asia Pacific X-ray Systems Market by country (2019A-2030F; €m; sales value)



	CAGR '19-'22 (%)	CAGR '22-'30 (%)
Others	8.5%	7.1%
Australia	5.7%	5.6%
South Korea	6.4%	6.7%
Southeast Asia	7.6%	7.4%
India	8.1%	7.5%
Japan	7.0%	6.7%
China	7.3%	6.9%

YoY % Growth

	2020A	2021A	2022A	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F
	(14.4%)	18.0%	26.4%	3.8%	4.8%	8.8%	6.1%	10.1%	5.5%	7.8%	10.1%
	(17.9%)	19.5%	20.3%	3.1%	5.8%	4.4%	7.5%	4.8%	4.8%	8.8%	5.8%
	(16.4%)	21.0%	19.0%	4.8%	6.4%	6.4%	8.7%	3.7%	6.5%	9.4%	7.7%
	(15.7%)	21.9%	21.2%	4.7%	7.0%	7.3%	9.5%	5.6%	6.4%	10.1%	8.6%
	(16.0%)	21.9%	23.3%	4.9%	6.6%	6.9%	9.6%	7.4%	6.6%	9.7%	8.2%
	(16.4%)	20.1%	21.9%	3.9%	6.4%	6.3%	8.0%	6.2%	5.6%	9.5%	7.6%
	(16.5%)	21.6%	21.6%	4.4%	6.6%	6.2%	9.3%	5.9%	6.1%	9.7%	7.5%

Key Notes

- Asia pacific market is dominated by China (52% of market share) assumed to be steady in the forecast period. Moreover the country is characterized by high healthcare government spending and efforts (from 2.9% in 2021 to 4.1% in 2033 of GDP) to improve healthcare infrastructure and services (e.g. incentives for private investment, public-private partnerships) that lead to CAGR 22-30 of 6.9%. The Chinese market has high restrictions for foreign players and mainly facilitates local companies.
- Among the Asia Pacific market, India and Southeast Asia show the highest growth rate (respectively CAGR 22-30 of 7.5% and 7.4%). In particular the Indian government, under the National Health Mission, aims to strengthen the healthcare sector (budget allocation of ca. €3.4b for 2023-2024); this includes the increasing of healthcare facilities and upgrading infrastructure
- In terms of healthcare technology development, Japan, among the most advanced countries in the Asia-Pacific region, is expected to grow with a CAGR 22-30 of 6.7%.

Source: PwC analysis, Fitch Solution, OECD (Organization for Economic Cooperation and Development) Health Statistics 2022, WHO (World Health Organization), Future market insights, Statista, Maia Research Analysis

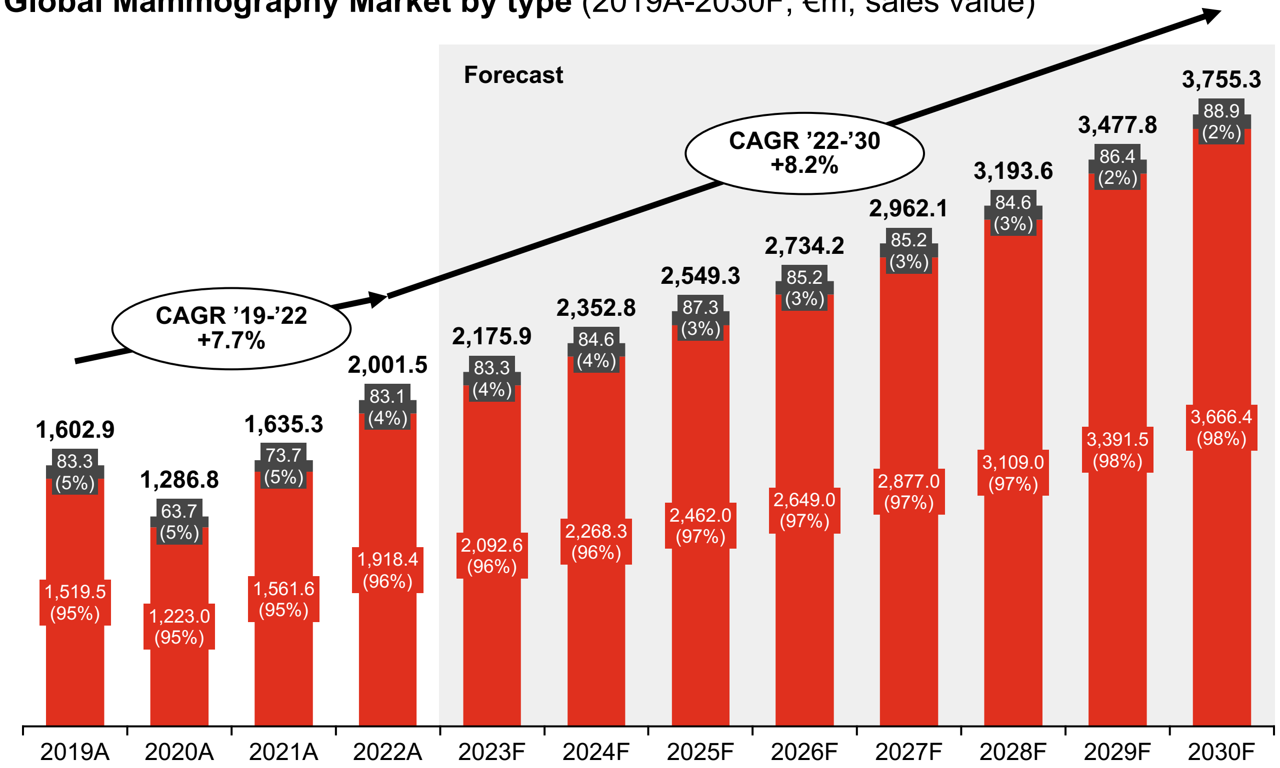
Market segmentation, size, dynamics and drivers

Mammography Devices

Sales Value (€m)

Global Mammography market is forecasted to grow with a CAGR '22-'27 of 8.2%, mainly due to increasing awareness about prevention for breast cancer

Global Mammography Market by type (2019A-2030F; €m; sales value)



YoY % Growth

	2020A	2021A	2022A	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F
Analog	(19.5%)	27.7%	22.8%	9.1%	8.4%	8.5%	7.6%	8.6%	8.1%	9.1%	8.1%
Digital	(23.5%)	15.6%	12.7%	0.3%	1.5%	3.2%	(2.4%)	0.0%	(0.7%)	2.2%	2.9%

	CAGR '19-'22 (%)	CAGR '22-'30 (%)
Analog	(0.1%)	0.8%
Digital	8.1%	8.4%

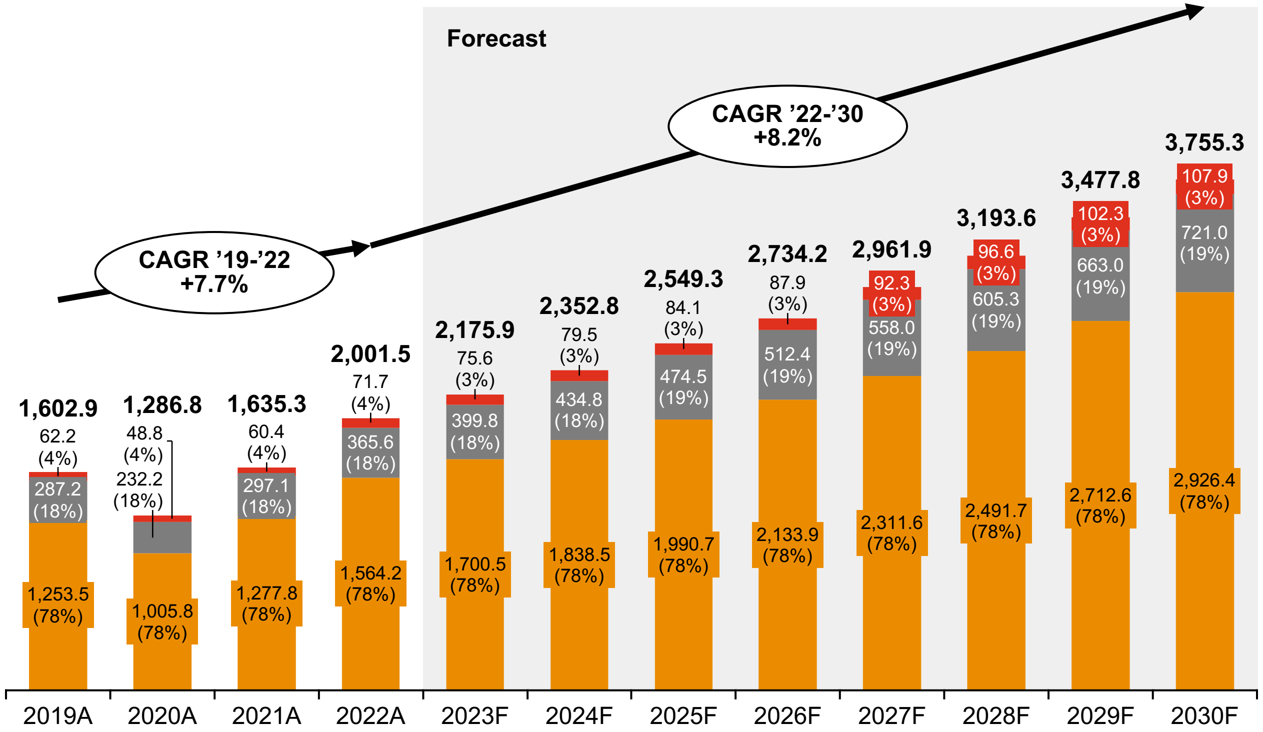
Key Notes

- Overall mammography market consists mainly of digital devices (98% of market share) mainly because of their advantages: (i) better image quality and resolution, (ii) greater flexibility in image manipulation and enhancement and (iii) facilitates easier storage, retrieval, and sharing of images. Therefore digital mammography market is assumed to grow with the highest rate (CAGR 22-30 +8.4%)
- High growth rate in the forecasted years for overall mammography market (CAGR 22-30 8.2%) are driven by significant increase in efforts to educate the public about breast cancer through awareness campaigns, educational programs, and community outreach initiatives. In addition, impact of breast cancer on society, both in terms of mortality rates and the emotional and financial burden on individuals and families, has prompted increased awareness

Source: PwC analysis, Fitch Solution, OECD (Organization for Economic Cooperation and Development) Health Statistics 2022, WHO (World Health Organization), Future market insights, Statista, Maia Research Analysis

In the Mammography market the hospitals have almost 80% of the total market shares but clinics show the highest growth rate (CAGR 22-30 8.9%)

Global Mammography Market by end user (2019A-2030F; €m; sales value)



	CAGR '19-'22 (%)	CAGR '22-'30 (%)
Other (1)	4.8%	5.2%
Clinic	8.4%	8.9%
Hospital	7.7%	8.1%

YoY % Growth

	(21.6%)	23.8%	18.7%	5.4%	5.2%	5.8%	4.5%	5.1%	4.6%	6.0%	5.4%
	(19.1%)	28.0%	23.0%	9.4%	8.8%	9.1%	8.0%	8.9%	8.5%	9.5%	8.8%
	(19.8%)	27.0%	22.4%	8.7%	8.1%	8.3%	7.2%	8.3%	7.8%	8.9%	7.9%

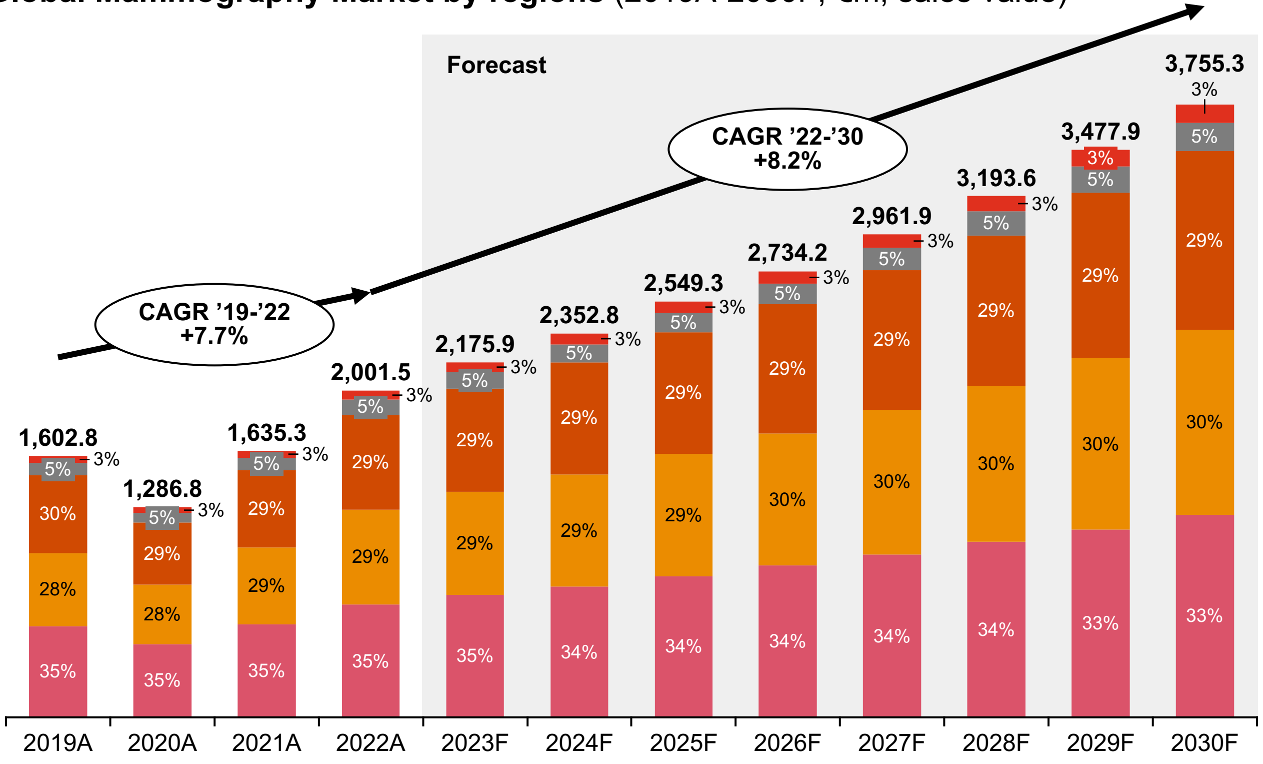
Key Notes

- The market segmentation shows a concentration of the total sales to hospitals (78% market share) explained by the larger number of hospitals in the market and their greater size compared to clinics, followed by private clinics and other categories (including veterinary clinics)
- The overall market is assumed to grow with CAGR 22-30 of 8.2%, mainly driven by hospitals (8.1%) and clinics (8.9%)
- The clinic segment has ca. 19% of the total market share and shows a higher growth, primarily driven by short waiting times in private facilities and more comfortable and private environment

Notes: (1) "Other" segment include veterinary hospitals, etc.
Source: PwC analysis, Fitch Solution, OECD (Organization for Economic Cooperation and Development) Health Statistics 2022, WHO (World Health Organization), Future market insights, Statista, Maia Research Analysis

North America, Asia Pacific and Europe drive the forecasted growth with cumulative market shares of approx. 93% and CAGR 22-30 in a range of 7.6% and 8.7%

Global Mammography Market by regions (2019A-2030F; €m; sales value)



YoY % Growth	2020A	2021A	2022A	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F
	(20.8%)	25.9%	23.9%	9.5%	9.6%	6.9%	8.4%	9.6%	8.5%	10.4%	8.9%
	(20.8%)	25.4%	23.5%	9.9%	9.0%	6.9%	5.9%	9.3%	8.9%	9.8%	6.5%
	(20.6%)	25.8%	22.0%	8.9%	8.8%	8.6%	6.2%	7.9%	8.0%	9.6%	8.2%
	(18.3%)	28.5%	24.0%	8.3%	9.3%	8.7%	8.2%	9.6%	7.4%	10.0%	8.0%
	(19.8%)	27.3%	21.2%	8.7%	6.4%	8.2%	7.4%	7.3%	7.8%	7.1%	7.8%

	CAGR '19-'22 (%)	CAGR '22-'30 (%)
Middle East and Africa	7.3%	9.0%
South America	7.0%	8.3%
Europe	6.8%	8.3%
Asia Pacific	9.2%	8.7%
North America	7.4%	7.6%

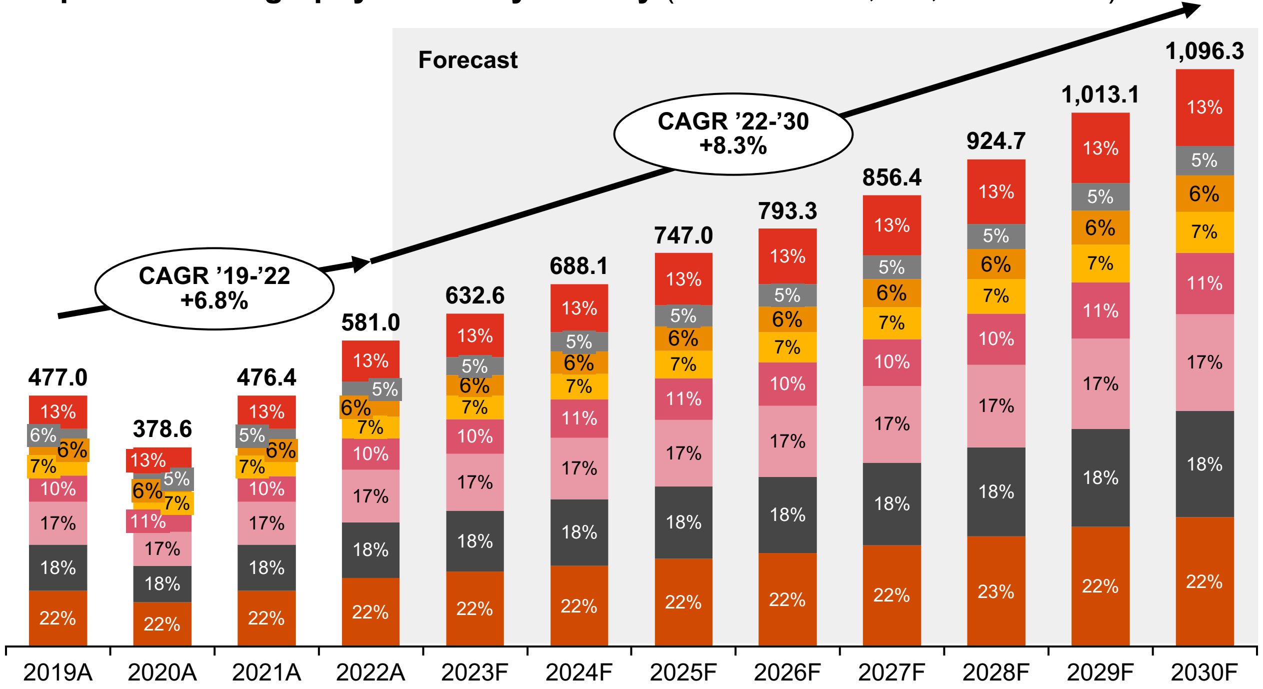
Key Notes

- The top 3 regions (North America, Asia Pacific and Europe) together hold approx. 93% of the total market shares, almost equally divided
- Europe and North America are the most mature markets where the expected growth (respectively 8.3% and 7.6% CAGR '22-'30) is mainly due to awareness campaigns toward diseases diagnosable with mammography machines (prominent individuals, celebrities, and organizations have been actively involved in raising awareness about breast cancer)
- In addition, growth in European countries is supported by the EU4Health program, which with an investment of €5.3 billion budget during the 2021-27 period will seek to reinforce healthcare crisis preparedness in the EU
- Growth in Asia Pacific is mainly attributable to the strengthening of the health care system in China and neighboring countries

Source: PwC analysis, Fitch Solution, OECD (Organization for Economic Cooperation and Development) Health Statistics 2022, WHO (World Health Organization), Future market insights, Statista, Maia Research Analysis

The top 4 countries (Germany, UK, France and Italy) together account for almost 70% of the European Mammography market, with Italy showing the highest growth rate among them

European Mammography Market by country (2019A-2030F; €m; sales value)



YoY % Growth

	2020A	2021A	2022A	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F
	(20.1%)	25.7%	22.0%	7.8%	8.9%	9.3%	6.1%	7.9%	6.9%	9.7%	8.9%
	(21.4%)	25.2%	21.1%	8.0%	8.0%	7.5%	5.7%	7.1%	7.2%	8.8%	7.2%
	(20.0%)	27.0%	23.1%	7.9%	9.9%	9.4%	7.2%	9.0%	7.0%	10.7%	9.1%
	(20.9%)	26.1%	19.7%	9.6%	9.5%	8.2%	6.4%	6.0%	8.7%	10.3%	7.9%
	(20.2%)	24.6%	20.9%	9.8%	10.0%	9.1%	5.2%	7.0%	8.9%	10.8%	8.8%
	(21.2%)	26.3%	22.8%	8.0%	8.5%	7.8%	6.6%	8.7%	7.1%	9.3%	7.5%
	(20.3%)	25.1%	21.5%	9.7%	8.5%	9.1%	5.6%	7.5%	8.8%	9.3%	8.7%
	(20.9%)	26.5%	22.8%	9.3%	8.2%	8.2%	6.8%	8.7%	8.4%	8.9%	7.8%

	CAGR '19-'22 (%)	CAGR '22-'30 (%)
Others	7.8%	8.2%
Nordic Countries	6.0%	7.4%
Benelux	7.7%	8.8%
Russia	6.1%	8.3%
Italy	6.9%	8.7%
United Kingdom	6.9%	7.9%
France	6.6%	8.4%
Germany	7.1%	8.3%

Key Notes

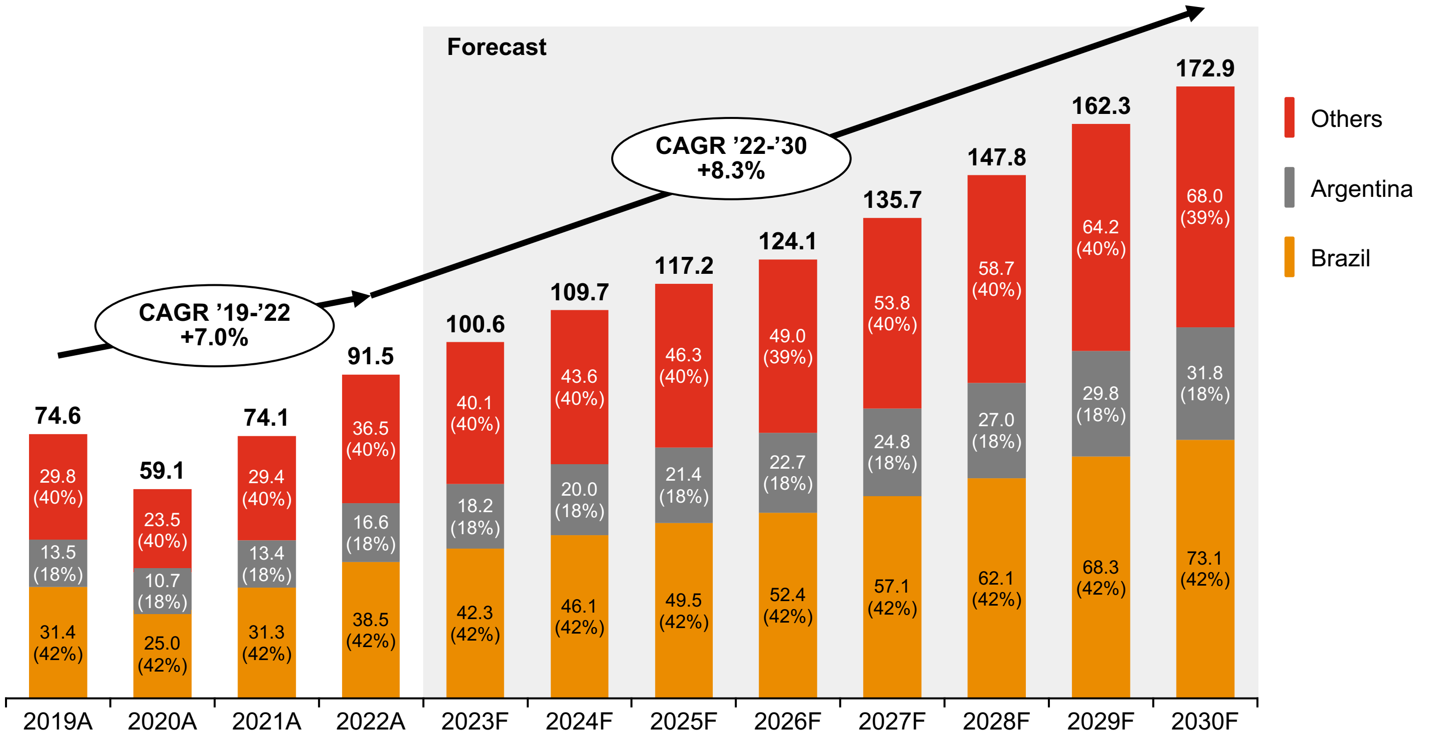
- Within the mammography market, all European countries are benefiting from increasing focus on mammography-diagnosable diseases, therefore it is assumed that almost all of them grow with a rate above 8.0%
- Excluding Benelux, Italy is the country with the highest growth (8.7% CAGR 22-30). The Italian government has implemented nationwide screening programs to offer free mammography screenings to women between the ages of 50 and 69 every two years. These programs aim to detect breast cancer at an early stage when treatment is most effective

Source: PwC analysis, Fitch Solution, OECD (Organization for Economic Cooperation and Development) Health Statistics 2022, WHO (World Health Organization), Future market insights, Statista, Maia Research Analysis

Sales Value (€m)

Brazil and Argentina together account for approx. 60% of the South American Mammography market, with a CAGR 22-30 in a range of 8.3% and 8.5%

South American Mammography Market by country (2019A-2030F; €m; sales value)



	CAGR '19-'22 (%)	CAGR '22-'30 (%)
Others	7.0%	8.1%
Argentina	7.1%	8.5%
Brazil	7.1%	8.3%

YoY % Growth

	2020A	2021A	2022A	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F
Others	(21.2%)	25.2%	24.1%	10.0%	8.6%	6.3%	5.7%	9.8%	9.1%	9.4%	6.0%
Argentina	(20.7%)	25.7%	23.4%	10.1%	9.4%	7.0%	6.1%	9.3%	9.1%	10.2%	6.7%
Brazil	(20.5%)	25.5%	23.0%	9.7%	9.2%	7.3%	5.9%	8.9%	8.7%	10.0%	7.0%

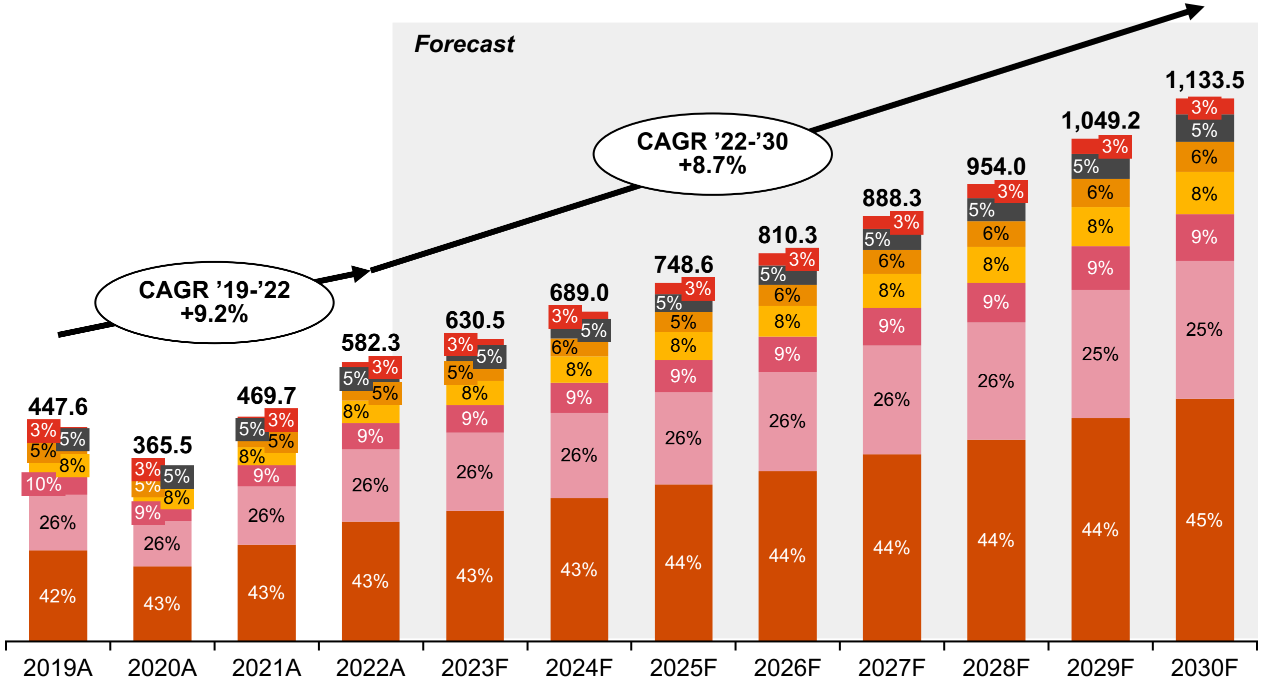
Key Notes

- Among South American countries Brazil shows the highest market share (42%). The forecasted demand for mammography machines (8.3% CAGR 22-30) is driven by the increasing awareness of breast cancer and the government's efforts to expand access to healthcare services (public healthcare system has been investing in the acquisition of mammography equipment to offer screenings to a larger population)
- Argentina also shows high growth (8.5% CAGR 22-30). The country has a well-established healthcare system with a focus on early detection and prevention of breast cancer and both public and private healthcare institutions are investing in modern mammography machines to meet the growing demand and improve diagnostic accuracy

Source: PwC analysis, Fitch Solution, OECD (Organization for Economic Cooperation and Development) Health Statistics 2022, WHO (World Health Organization), Future market insights, Statista, Maia Research Analysis

In the Asia Pacific Mammography market, China and Japan hold over 70% of the total market shares and a growth rate between 8.4% and 9.2%

Asia Pacific Mammography Market by country (2019A-2030F; €m; sales value)



YoY % Growth

	2019A	2020A	2021A	2022A	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F
		(19.4%)	26.5%	23.0%	7.0%	7.8%	7.2%	6.5%	8.7%	6.1%	8.5%	6.6%
		(18.2%)	27.3%	22.8%	9.2%	9.7%	8.8%	7.2%	8.6%	8.3%	10.4%	8.2%
		(18.8%)	29.4%	25.1%	9.0%	9.6%	8.0%	9.0%	10.6%	8.2%	10.3%	7.4%
		(18.7%)	29.3%	24.5%	7.4%	8.1%	8.1%	8.9%	10.1%	6.5%	8.8%	7.5%
		(19.2%)	27.1%	23.0%	6.9%	8.3%	7.5%	7.1%	8.8%	6.0%	9.0%	6.9%
		(18.5%)	27.9%	24.1%	7.8%	9.0%	8.4%	7.7%	9.8%	6.9%	9.7%	7.8%
		(17.8%)	29.2%	24.0%	8.9%	9.9%	9.3%	8.8%	9.7%	8.0%	10.6%	8.7%

	CAGR '19-'22 (%)	CAGR '22-'30 (%)
Others	7.8%	7.3%
Australia	8.5%	8.8%
South Korea	9.5%	9.0%
Southeast Asia	9.4%	8.2%
India	8.1%	7.6%
Japan	8.9%	8.4%
China	9.6%	9.2%

Key Notes

- China represents the majority of the market (52%). The growing awareness of breast cancer among the population has resulted in an increased demand for mammography screening, which, combined with the rapid expansion of the healthcare system in China, has led to exceptional growth (CAGR '22-'30 9.2%). The Chinese market has high restrictions for foreign players and mainly facilitates local companies.
- Although South Korea is a smaller market than China, the focus on mammography is thriving. South Korea's healthcare system has a strong focus on preventive medicine, including breast cancer screening, and public and private healthcare institutions are investing in advanced mammography equipment to enhance diagnostic capabilities and improve the accuracy of breast cancer diagnosis.

Source: PwC analysis, Fitch Solution, OECD (Organization for Economic Cooperation and Development) Health Statistics 2022, WHO (World Health Organization), Future market insights, Statista, Maia Research Analysis

Major market trends, key entry barriers and inhibitors

The main trends in global healthcare market are represented by: (i) ageing population, (ii) awareness of diagnostics and health issues, (iii) access to healthcare in emerging economies,…

Healthcare Market Trend (1/3)

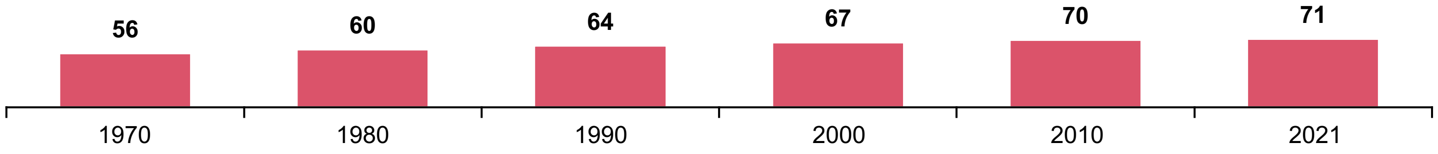
Global Healthcare Market Trends

Trend	Description	Impact on Radiology market

Increase of geriatric population

- As the population ages, there is an increased demand for medical devices to address age-related health issues and conditions, creating a growing market for devices such as radiology devices
- According to the WHO, between 2015 and 2050, the portion of the world's population over the 60 years is expected to nearly double from 12% to 22%
- By 2050, the global oldest population segment (80 years or older) is anticipated to grow from 126.5 million to 446.6 million

World Average Life expectancy (1970-2021; average years)



Greater awareness of diagnostics and health issues

- Increased awareness on health related issues and trust in diagnostics is generating a growing demand for preventive diagnostic measures and screening solutions
- Greater awareness of the power of prevention benefiting both patients, who can tackle diseases at early stages, and the entire healthcare system by alleviating pressure and burden due to timely and accurate detection

Access to healthcare in emerging economies

- Emerging countries such as India and Southeast Asia have embarked on a process of increasing investment in healthcare (from 3% to 5% of GDP) to catch up with the average of developed countries (12% of GDP)
- As more individuals in these economies gain access to healthcare services, there is a growing demand for medical devices to support diagnosis, treatments and management of various health conditions
- Over the next 30 years, the over-65 population in emerging markets will grow with a rate of +2.7% annually, more than double the rate of developed countries, this generates a higher need for health care

Source: PwC analysis, Fitch Solution, OECD (Organization for Economic Cooperation and Development) Health Statistics 2022, WHO (World Health Organization), Future market insights, Statista

…(iv) increase in public healthcare spending also through government funds,…

Healthcare Market Trend (2/3)

Trend	Description	Impact on Radiology market

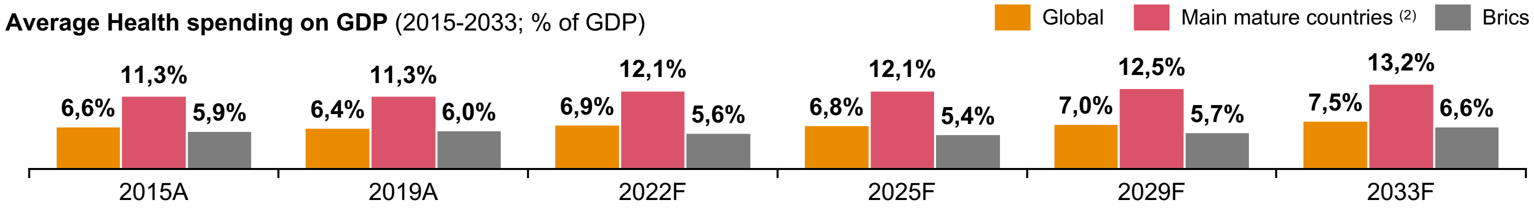
Global Healthcare Market Trends

Increase in public healthcare spending

Health spending

- Among the main mature countries, in 2020, the Top 5 countries health spending on % of GDP were: (i) USA – 19.7%; (ii) Germany – 12.7%; (iii) UK – 12.7%; (iv) France – 12.1%; (v) Spain – 10.8%
- In 2020, for BRICS[1] countries, the Top 5 countries health spending on % of GDP were: (i) Brazil – 10.3%; (ii) South Africa – 8.5%; (iii) Egypt – 7.3%; (iv) China – 6.2%; (v) UAE – 5.5%
- In 2020, the ratio of the Italian health spending to GDP was 9.6%

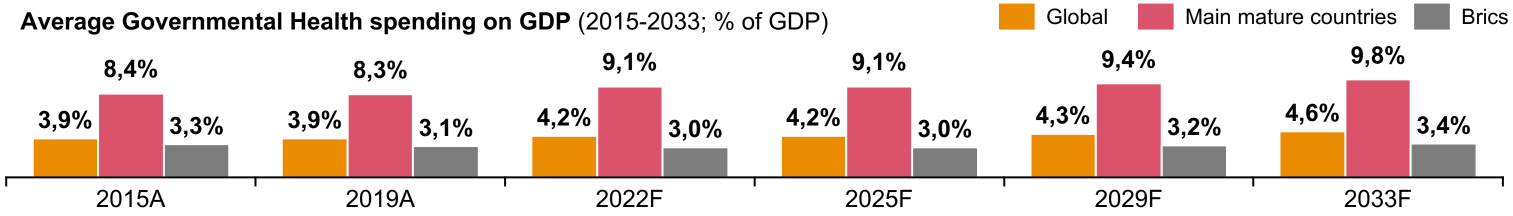
Average Health spending on GDP (2015-2033; % of GDP)



Governmental Health spending

- Among the main mature countries, in 2020, the Top 5 countries governmental health spending on % of GDP were: (i) Germany – 10.8%; (ii) UK– 10.6%; (iii) USA – 10.6%; (iv) France – 10.3%; (v) Japan – 9.0%
- In 2020, for BRICS countries, the Top 5 countries governmental health spending on % of GDP were : (i) Brazil – 4.7%; (ii) Egypt – 4.7%; (iii) UAE – 4.6%; (iv) South Africa – 4.3%; (v) China – 3.7%
- In 2020, the ratio of the Italian governmental health spending to GDP was 7.3%

Average Governmental Health spending on GDP (2015-2033; % of GDP)



Notes:(1) BRICS includes Brazil, China, Egypt, Ethiopia, India, Iran, South Africa and United Arab Emirates; these countries are considered as the world most important developing countries; (2) includes: France, Germany, Italy, Japan, Spain, UK and USA
Source: PwC analysis, Fitch Solution, OECD (Organization for Economic Cooperation and Development) Health Statistics 2022, WHO (World Health Organization), Future market insights, Statista

…(v) development of advanced technologies and (vi) automation, (vii) dumping activities and (viii) raw material prices' increase

Healthcare Market Trend (3/3)

Global Healthcare Market Trends

Trend	Description	Impact on Radiology market
Automation and focus on productivity	• Ongoing demand for further automation in order to: (i) increase productivity, (ii) mitigate the scarcity of skilled staff, (iii) reduce human error, (iv) increase profitability	↑
Development of advanced technologies	• Technology advancements have a transformative impact on the field of diagnostics, enabling faster, more precise, accurate and innovative diagnostics solutions • The integration of automation and robotics, combined with artificial intelligence, in Hospitals and Clinics reduces human errors, and increases testing throughput	↑
Dumping activities	• Dumping practice refers to the commercialization of medical devices at prices lower than their domestic market prices or production costs by outsourcing or relocating the production in those developing countries, such as India and China, with (i) weaker regulatory oversight, (ii) less competitive markets and (iii) lower price of raw materials, where the large international players have an higher bargaining power with the local suppliers or production sites	↓
Increase in raw material and energy prices	• Significant increase in raw material and energy costs not easily passed-through to clients, constrained by multi-year nature of contracts, especially with the Public Administrations • Increasing costs and inflation levels may translate into an erosion of profitability	↓

Source: PwC analysis, Fitch Solution, OECD (Organization for Economic Cooperation and Development) Health Statistics 2022, WHO (World Health Organization), Future market insights, Statista

Focusing on X-ray Systems market, the development of non-invasive treatments and precision medicine will drive the expected market growth

Global X-ray Systems market trend

Global X-ray Systems Market Trends

Trend	Description	Impact on Radiology market
Development of non-invasive treatments	• The development of non-invasive treatments has been a significant and ongoing area of research and innovation in various fields of medicine and healthcare. Non-invasive do not require surgical incisions or penetration of the skin, offering advantages such as reduced risk of infection, shorter recovery times, shorter hospital stays or even no need for hospitalization and often greater patient comfort. • In diagnostic imaging, the development of non-invasive treatments mainly refer to advances in technologies like X-ray, magnetic resonance imaging (MRI), computed tomography (CT) scans, and ultrasound have allowed for detailed visualization of internal structures without the need for invasive procedures. • The ongoing advancements in technology, materials science, and medical research contribute to the continued growth of non-invasive treatments, offering patients safer and more accessible alternatives to traditional invasive procedures.	↑
Development of precision medicine	• Precision medicine, also known as personalized medicine, is an innovative approach to medical treatment and healthcare that takes into account individual differences in patients' genes, environments, and lifestyles. The goal is to tailor medical care and interventions to the specific characteristics of each patient, allowing for more targeted and effective treatments. Precision medicine means preventive, personalized, precision, population, and participatory medicine • In recent years, interest in and research into precision medicine technologies, such as X-ray, has increased significantly, different X-ray kilovolt values, doses, exposure times, pulse numbers, etc. may affect patients differently • The choice of more efficient and accurate machines that increasingly reduce exposure to radiation will be crucial • The development of precision medicine continues to evolve as research expands and technologies advance. This approach holds great promise for improving treatment outcomes, reducing adverse effects, and enhancing overall patient care by tailoring interventions to the unique characteristics of each individual.	↑

Source: PwC analysis, Fitch Solution, OECD (Organization for Economic Cooperation and Development) Health Statistics 2022, WHO (World Health Organization), Future market insights, Statista

Projected growth in the mammography machine market is supported by rising cases of breast cancer and the application of new technologies to traditional machines

Global mammography market trend

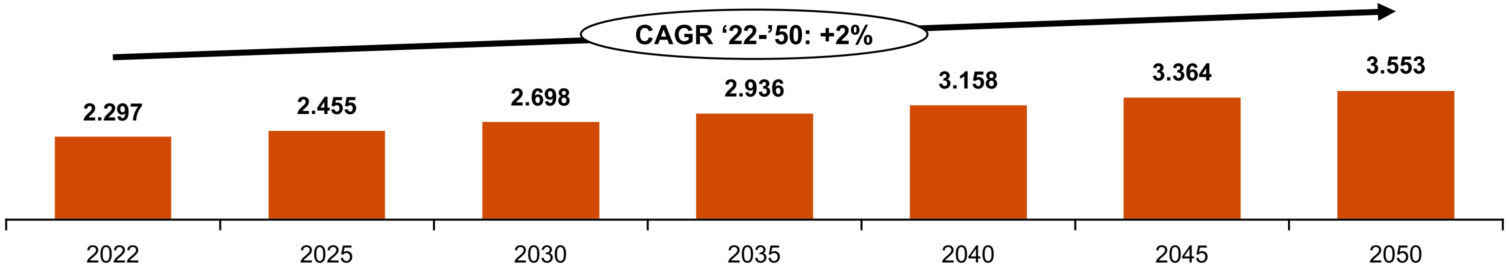
Global Mammography Market Trends

Trend	Description	Impact on Radiology market

Breast cancer incidence increase

- Mammography devices are mainly used to prevent and diagnose breast cancer cases, that are forecasted to grow in the future due to increasing prevalence of risk factors (such as obesity, sedentary lifestyles, and hormonal imbalances, which contribute to the development of breast cancer)
- Technological developments (e.g. more efficient and low-dose new devices) is going to be implemented in order to face these disease and increase the effectiveness of preventive visits, that will reduces the public costs incurred to treat breast cancer patients

New breast cancer cases per year worldwide – forecasted values (value in k)



Application of artificial intelligence in mammography machines

- Mammography could use artificial intelligence algorithms and big data analysis, combined with medical expertise, to provide doctors with fast and accurate medical judgment and diagnostic support
- AI-assisted medical diagnosis technology not only improves the accuracy and efficiency of medical diagnosis, but also brings a better treatment experience to patients
- In addition, artificial intelligence-based screening and computer-assisted testing significantly reduce false-positive readings and increase cancer detection

Source: PwC analysis, Fitch Solution, OECD (Organization for Economic Cooperation and Development) Health Statistics 2022, WHO (World Health Organization), Future market insights, Statista

The key barriers and inhibitors that prevent new players from entering the radiology market are: (i) economies of scale, (ii) know how, (iii) capital requirement, (iv) regulation and (v) replacement cost

Radiology market entry barriers

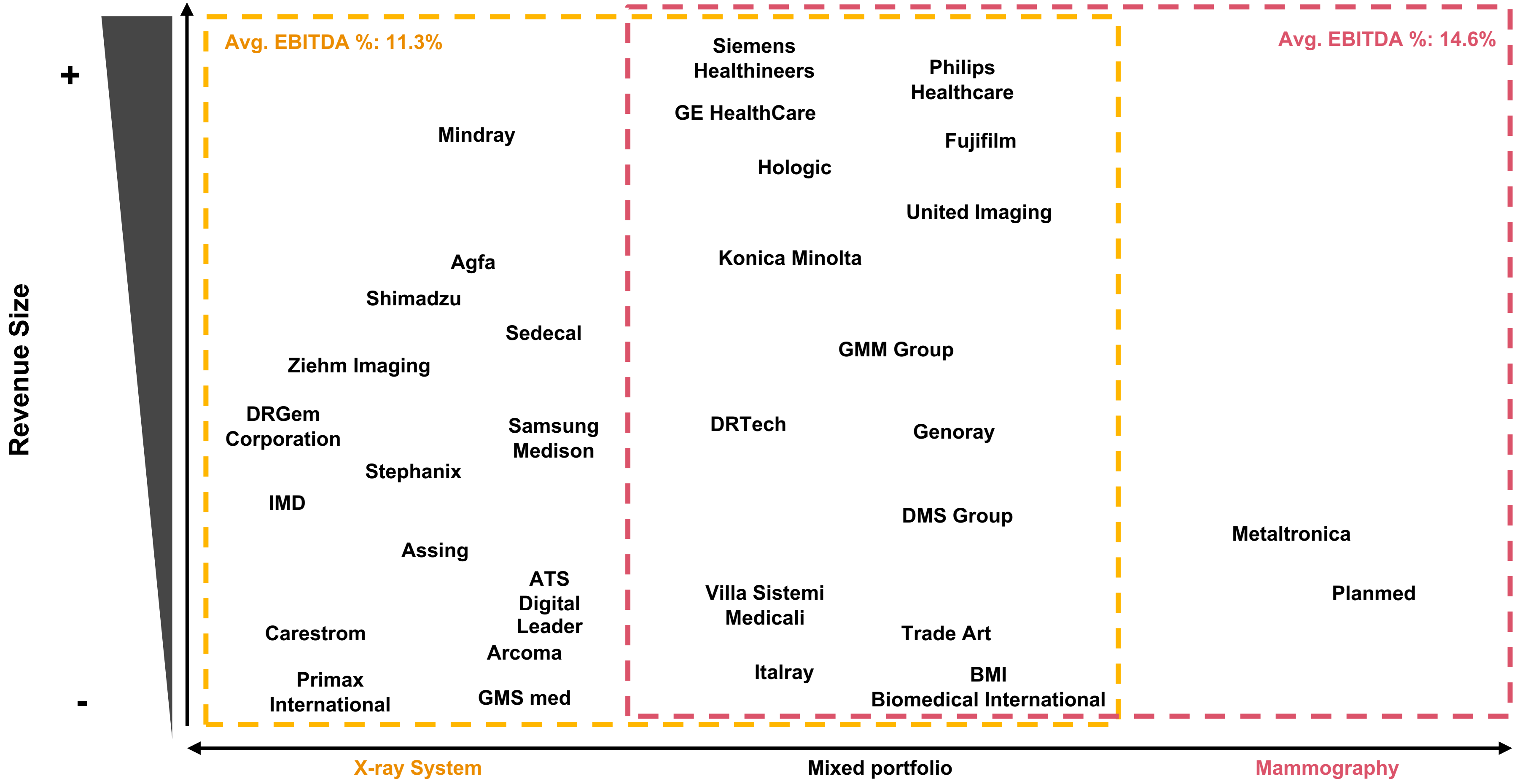
Barrier	Description	Barrier Strenght
Economies of scale	• Large players benefit from operational and financial economies of scale which enable lower productions cost, higher margins and predominant positioning with key suppliers • Economies of scale enable a higher quality of service	
Know How	• High technological content of the products offered, which requires a high degree of specialization and skills • Strong R&D department to develop innovative products to be competitive in the market and to create client “look in” effect with specialized and customized solutions	
Capital requirement	• High investment in R&D and M&A strategies in order to innovate and to diversify the product portfolio in order to maintain competitiveness • High initial costs: establishing radiology facilities, acquiring state-of-the-art imaging equipment (such as MRI machines, CT scanners, and X-ray machines), and maintaining compliance with evolving technological standards require significant financial investment	
Regulation	• Compliance with stringent quality and safety standards is crucial in radiology due to the potential risks associated with diagnostic imaging • Difficulties in obtaining the certifications essential to the marketing of products	
Replacement costs	• High replacement costs especially for OEM companies to find reliable and trusted suppliers providing high quality products in short terms	

Source: PwC analysis, Fitch Solution, OECD (Organization for Economic Cooperation and Development) Health Statistics 2022, WHO (World Health Organization), Future market insights, Statista

Competitive environment

The competitive arena can be segmented into 2 clusters in accordance with radiology market player's portfolio focus on X-ray systems and/or Mammography devices

Competitive arena – by Size and Product Portfolio



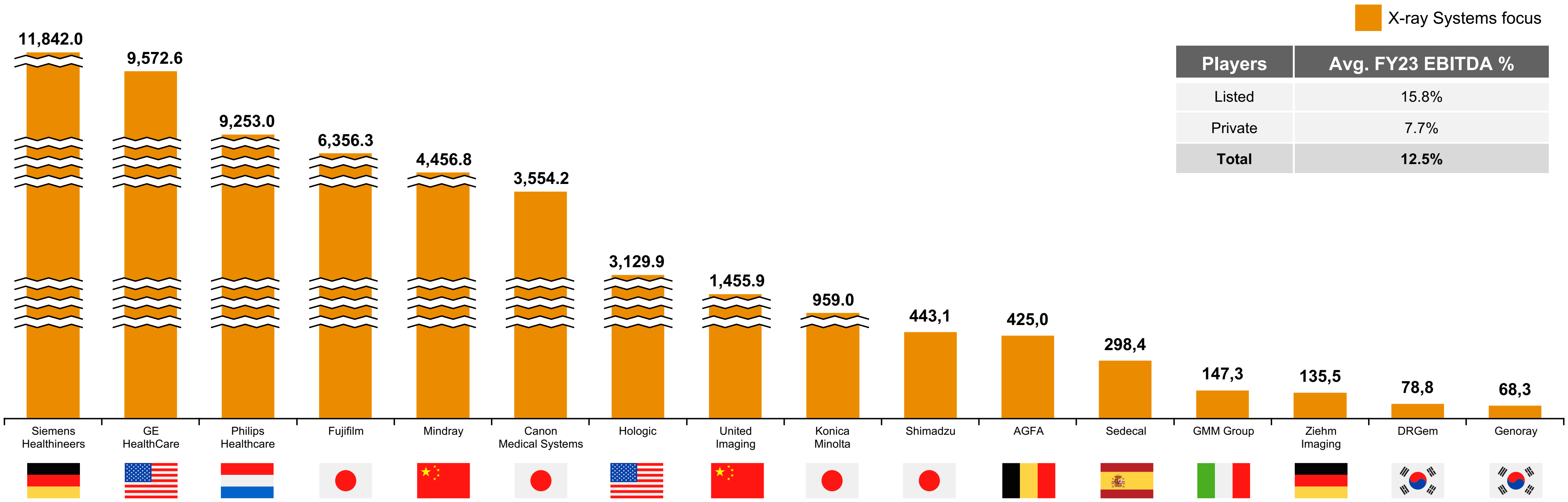
Key Notes

- **X-ray Systems focus**: players that offer mainly X-ray System product, such as (i) mobile, (ii) adjustable, (iii) radiographic, (iv) fluoroscopy, (v) analog and (vi) digital
- **Mammography Devices focus**: players that offer mainly mammography devices, such as (i) analog, (ii) digital and (iii) digital breast tomosynthesis

:
Source: PwC analysis, Aida, Orbis, Capital IQ, Annual reports

Among companies with a X-ray Systems focus, the biggest players in terms of revenues are listed on stock exchange markets…

X-ray Systems players key financials (1/2)[1] (2023A, €m)



Players	Avg. FY23 EBITDA %
Listed	15.8%
Private	7.7%
Total	**12.5%**

	Siemens Healthineers	GE HealthCare	Philips Healthcare	Fujifilm	Mindray	Canon Medical Systems	Hologic	United Imaging	Konica Minolta	Shimadzu	AGFA	Sedecal	GMM Group	Ziehm Imaging	DRGem	Genoray
EBITDA%	23.4%	18.2%[3]	13.4%	14.5%[3]	37.0%	15.0%	31.8%[3]	17.2%	9.3%[3]	17.8%[3]	8.9%	7.5%[2]	15.3%	13.9%[2]	10.5%	17.4%
Rev. CAGR 21-23	+9.8%	+7.4%	+2.3%	n.a.	+12.9%	(1.6%)	(14.8%)	+20.4%	+6.6%	+13.0%	(4.3%)	+1.7%[2]	+9.6%	+2.4%[2]	+11.1%	+11.2%
Listed / Private:	Listed	Listed	Listed	Listed	Listed	Listed	Listed	Listed	Listed	Listed	Listed	Private	Private	Private	Listed	Listed

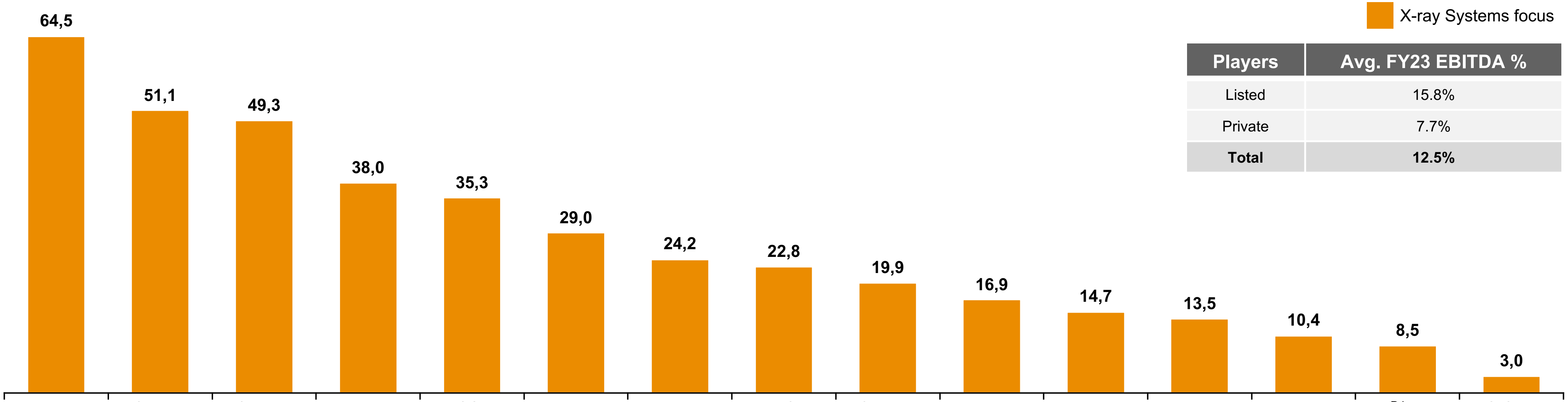
Notes: (1) revenues with currencies other than euro converted using the average rate for the year under consideration; (2) Refer to 2022 Financials (or CAGR 2020-2022); (3) Revenues refer only to X-ray systems BU, while EBITDA% to consolidated P&L, as not available EBITDA for BU
Source: PwC analysis, Aida, Cerved, Orbis, Capital IQ, Annual reports

...and they show higher profitability on average compared to private companies (Avg. FY23 EBITDA margin of 15.8% vs. 7.7%)

X-ray Systems players key financials (2/2)[1] (2023A, €m)

X-ray Systems focus

Players	Avg. FY23 EBITDA %
Listed	15.8%
Private	7.7%
Total	**12.5%**

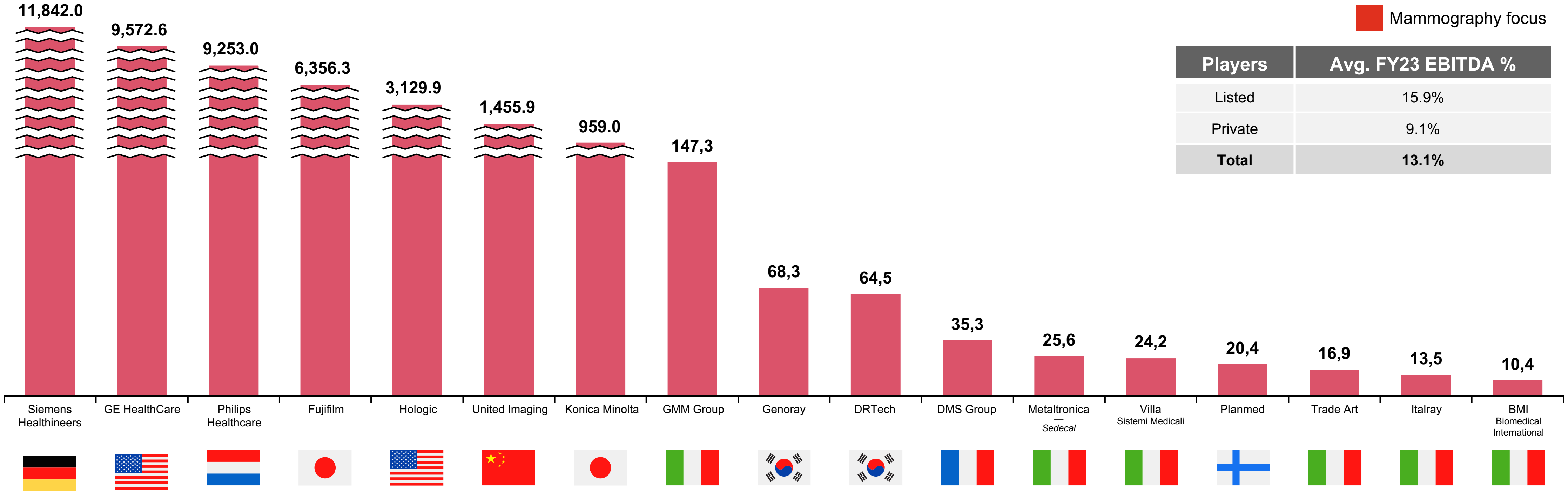


	DRTech	Samsung Medison	Stephanix — *Sedecal*	IMD	DMS Group	Assing	Villa Sistemi Medicali	ATS Digital Leader — *Sedecal*	Caresteam	Trade Art	Arcoma	Italray	BMI Biomedical International	Primax — *Sedecal*	GMS med
EBITDA%	8.5%	n.a.	5.7%[2]	11.5%	5.7%[2]	5.7%[2]	0.7%	19.6%[2]	10.9%[2]	4.7%[2]	7.8%[2]	11.6%[2]	2.2%[2]	1.4%[2]	2.8%[2]
Rev. CAGR 21-23	+11.1%	n.a.	(0.2%)[2]	(9.3%)	+5.9%[2]	+17.5%[2]	(3.5%)	+47.6%[2]	(0.6%)[2]	+11.0%[2]	+13.5%	(11.4%)[2]	(11.6%)[2]	+57.1%[2]	+34.9%[2]
Listed / Private:	Listed	Private	Private	Listed	Listed	Private	Private	Private	Private	Private	Private	Listed	Private	Private	Private

Notes: (1) revenues with currencies other than euro converted using the average rate for the year under consideration; (2) Refer to 2022 Financials (or CAGR 2020-2022)
Source: PwC analysis, Aida, Cerved, Orbis, Capital IQ, Annual reports

Even among market players with Mammography Devices focus, listed companies show on average a higher profitability compared to private companies (Avg. FY23 EBITDA margin of 15.9% vs. 9.1%)

Mammography Devices players key financials[1] (2023A, €m)



Players	Avg. FY23 EBITDA %
Listed	15.9%
Private	9.1%
Total	**13.1%**

EBITDA%	23.4%	18.2%[4]	13.4%	14.5%[4]	31.8%[4]	17.2%	9.3%[4]	15.3%	17.4%	8.5%	5.7%[3]	12.2%[3]	0.7%	17.1%[3]	4.7%[3]	11.6%[3]	2.2%[3]
Rev. CAGR 21-23	+9.8%	+7.4%	+2.3%	n.a.	(14.8%)	+20.4%	+6.6%	+9.6%	+11.2%	+11.1%	+5.9%[2]	+35.0%[2]	(3.5%)	+7.5%[2]	+11.0%[2]	(11.4%)[2]	(11.6%)[2]
Listed / Private:	Listed	Listed	Listed	Listed	Listed	Listed	Listed	Private	Listed	Listed	Listed	Private	Private	Private	Private	Private	Private

Notes: (1) revenues with currencies other than euro converted using the average rate for the year under consideration; (2) % on total sales of Philips Healthcare, not radiologic segment only; (3) Refer to 2022 Financials (or CAGR 2020-2022); (4) Revenues refer only to X-ray systems BU, while EBITDA% to consolidated P&L, as not available EBITDA for BU
Source: PwC analysis, Aida, Cerved, Orbis, Capital IQ, Annual reports

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