



World's Best Smart Hospitals 2021

The pandemic put hospitals through the ultimate stress test. By forcing them to adapt to waves of COVID-19 patients, changing treatment protocols, faltering supply chains and a massive vaccine rollout, to name just a few of the challenges of the past year, the outbreak drove home the importance of advanced technology. The hospitals that best weathered the crisis were by and large the ones that were already open to integrating new technologies and taking advantage of data-driven opportunities as they become available.

This lesson may turn out to be one of the most profound and lasting effects of the pandemic. Hospitals around the world now have a renewed sense of urgency to provide effective telehealth services, use real-time data to

quickly and efficiently allocate staff and other resources where most needed and monitor the flow of patients along care pathways during peak demand periods.

In this respect, the pandemic has accelerated a trend that has been years in the making. Information technology and other tools that make hospitals "smarter" have already become a big differentiator in most health care markets. It's no wonder that the market for smart-hospital technology is expected to reach \$35 billion in 2021 and balloon to \$83 billion by 2026. Fueling this new businesses is a growing and aging population, rising expectations on the part of patients for access to high-quality care and improved customer experiences and increasing

pressure to contain skyrocketing health care costs. Technology is not only the best way for hospitals to achieve these goals, it may be the only way.

At the top of the list of technologies that hospitals need is telehealth. The ability to provide services, monitor patients and communicate with them remotely proved invaluable during the pandemic. Telehealth can benefit hospitals and patients in other ways. Helping patients while they're in their homes reduces costs, catches more problems faster, reduces infection and makes health care more comfortable and convenient. And shifting rehabilitation to the home means that patients can be released from the hospital sooner, notes Dr. Eyal Zimlichman, Chief Innovation Officer at Sheba Medical Center in Israel. Those capabilities will enable hospitals to shrink their costly physical facilities even while improving and expanding care.

Remote monitoring is becoming important for in-patient care as well. By giving patients wearable devices, clinicians can keep a closer eye on them as they walk around the rooms and hallways. Patients can take some wearables out of the hospital and into their homes, workplaces and the great outdoors. The data collected from these devices provide early warnings of impending problems, which doctors can often deal with remotely with advice and prescriptions rather than unnecessary hospitalizations.

Machine-learning and other forms of artificial intelligence (AI) are starting to open up entirely new horizons in care. Clinicians can't spend their days watching a stream of patient data, nor can they drop everything to focus on every blip and hiccup turning up in the many data streams from a large patient population. But a machine-learning algorithm can do all that for them, filtering out noise and false alarms, while funneling useful summaries and critical alerts to the appropriate clinicians. Machine learning will soon play a central role in diagnosis and clinical decision-making. One area where AI is already having impact is in image screening. For instance, Charité Universitätsmedizin, a hospital in Berlin, is providing images and diagnoses to developers of AI software to train and validate their systems. Surgery is also benefiting from machine-learning and other advanced technologies. Some smart hospitals are already deploying advanced imaging techniques to prepare pre-surgery "digital clones" of patients—that is, virtual 3D-images that allow surgeons to examine a patient's anatomy from all angles, which helps in planning the best surgical approach and anticipate abnormalities.

Such pre-surgical patient simulations will be standard in operating rooms at smart hospitals within 10 years, predicts Luc Soler, a professor at the University Hospital of Strasbourg, and president of Visible Patient, which is developing modeling technology. Over time, these capabilities will be combined with robotic surgery, which has many advantages over conventional surgery, says Dr. Jacques Marescaux, president of the Research Institute Against Digestive Cancer in Strasbourg, France. Robotic surgery, he says, entails "lower risk of complications, ensures better patient safety and lower expenses due to readmissions." Some of the biggest technology-driven improvements in patient care will come from providing hospital administrators and clinical leaders with insights mined from vast, constantly expanding collections of patient data. For example, Karolinska University Hospital in Stockholm is analyzing data in near real time to make adjustments to patient care and to determine the best use of imaging and other advanced tools.

These advances, of course, depend fundamentally on having state-of-the-art electronic health records (EHRs). Smart hospitals are tying more and more of their functions and decisions into the data being mined from their EHRs, using the results to train clinicians and fine-tune care. "The basis for high quality is collected data," says

Dr. Alan Forster, chief innovation officer of Ottawa Hospital in Canada. "This data can help to make better management decisions." In the end, investments in smart-hospital technology will be evaluated on whether they improve outcomes for patients, with less time in the hospital and at lower cost. "Innovative treatments must bring an increased benefit, says Dr. Gregory Katz of the University of Paris School of Medicine. "By comparing outcomes across hospitals, it is possible to ensure that every patient in every hospital receives good quality health care."

To bring you up to speed on this paradigm shift in health care delivery, **Newsweek** partnered with data firm **Statista** to develop a list of 250 hospitals that best avail themselves of the most advanced technologies. They lead in their use of AI, robotic surgery, digital imaging, telemedicine, smart

Rank		Country	City	State (US only)
1	Mayo Clinic - Rochester	United States	Rochester	MN
2	The Johns Hopkins Hospital	United States	Baltimore	MD
3	Cleveland Clinic	United States	Cleveland	OH
4	The Mount Sinai Hospital	United States	New York	NY
5	Massachusetts General Hospital	United States	Boston	MA
6	Brigham And Women's Hospital	United States	Boston	MA
7	Cedars-Sinai Medical Center	United States	Los Angeles	CA
8	Karolinska Universitetssjukhuset	Sweden	Solna	
9	MD Anderson Cancer Center	United States	Houston	TX
10	Charité - Universitätsmedizin Berlin	Germany	Berlin	
11	Memorial Sloan Kettering Cancer Center	United States	New York	NY
12	Houston Methodist Hospital	United States	Houston	TX
13	Sheba Medical Center	Israel	Ramat Gan	
14	New York-Presbyterian Hospital-Columbia and Cornell	United States	New York	NY
15	Beth Israel Deaconess Medical Center	United States	Boston	MA
16	Boston Medical Center Corporation	United States	Boston	MA
17	Abbott Northwestern Hospital	United States	Minneapolis	MN

18	Stanford Health Care - Stanford Hospital	United States	Stanford	CA
19	Aarhus Universitetshospital	Denmark	Aarhus	
20	AP-HP - Hôpital Européen Georges Pompidou	France	Paris	
21	Aalborg Universitetshospital	Denmark	Aalborg	
22	Saratoga Hospital	United States	Saratoga Springs	NY
23	Fortis Memorial Research Institute	India	Gurugram	
24	UCLA Santa Monica Medical Center	United States	Santa Monica	CA
25	Institut Gustave Roussy	France	Villejuif	
26	Mount Sinai Morningside	United States	New York	NY
27	Mayo Clinic - Phoenix	United States	Phoenix	AZ
28	Universitätsklinikum Essen	Germany	Essen	
29	AP-HP - Hôpital Universitaire Pitié Salpêtrière	France	Paris	
31	Samsung Medical Center	South Korea	Seoul	
32	Changi General Hospital	Singapore	Singapore	
33	Oslo Universitetssykehus	Norway	Oslo	

34	Istituto Clinico Humanitas	Italy	Rozzano	
35	Ronald Reagan UCLA Medical Center	United States	Los Angeles	CA
36	St. Olavs Hospital	Norway	Trondheim	
37	Gleneagles Hospital	Singapore	Singapore	
38	Helsinki University Hospital	Finland	Helsinki	
39	The University of Tokyo Hospital	Japan	Tokyo	
40	Barnes-Jewish Hospital	United States	Saint Louis	MO
41	UCSF Medical Center	United States	San Francisco	CA
42	Hospital For Special Surgery	United States	New York	NY
43	Hospital Universitari Vall d'Hebron	Spain	Barcelona	
44	Brigham And Women's Faulkner Hospital	United States	Boston	MA
45	Akademiska Sjukhuset	Sweden	Uppsala	
46	Mayo Clinic - Jacksonville	United States	Jacksonville	FL
47	Hospital Israelita Albert Einstein	Brazil	Sao Paulo	
48	Jefferson Health - Thomas Jefferson University Hospitals	United States	Philadelphia	PA

49	Universitätsspital Zürich	Switzerland	Zürich	
50	Hospital of the University of Pennsylvania - Penn Presbyterian	United States	Philadelphia	PA
51	Ospedale Pediatrico Bambino Gesù di Roma	Italy	Roma	
52	Boston Children's Hospital	United States	Boston	MA
53	Kyoto University Hospital	Japan	Kyoto	
54	Mount Sinai Medical Center	United States	Miami Beach	FL
55	Azienda Ospedaliera San Camillo Forlanini	Italy	Roma	
56	Centre hospitalier de l'Université de Montréal	Canada	Montreal	
57	Erasmus Medisch Centrum	The Netherlands	Rotterdam	
58	Ospedale San Raffaele - Gruppo San Donato	Italy	Milano	
59	Hospital Clínic de Barcelona	Spain	Barcelona	
60	Toronto General - University Health Network	Canada	Toronto	
61	Universitätsklinikum Düsseldorf	Germany	Düsseldorf	
62	University of Chicago Medical Center	United States	Chicago	IL
63	Duke University Hospital	United States	Durham	NC

64	Seoul National University Hospital	South Korea	Seoul	
65	Asan Medical Center	South Korea	Seoul	
66	Singapore General Hospital	Singapore	Singapore	
67	University College Hospital	United Kingdom	London	
68	St Thomas' Hospital	United Kingdom	London	
69	Clemenceau Medical Center	Lebanon	Beirut	
70	Children's Medical Center Dallas	United States	Dallas	TX
71	Guy's Hospital	United Kingdom	London	
72	Nagoya University Hospital	Japan	Nagoya	
73	Hospital General Universitario Gregorio Marañón	Spain	Madrid	
74	NYU Langone Hospitals	United States	New York	NY
75	The Ottawa Hospital	Canada	Ottawa	
76	AP-HP - Hôpital Saint-Louis	France	Paris	
77	Hospital Universitario 12 de Octubre	Spain	Madrid	
78	Royal Brompton Hospital	United Kingdom	London	

79	Johns Hopkins Bayview Medical Center	United States	Baltimore	MD
80	Apollo Hospital - Chennai	India	Chennai	
81	Lucile Salter Packard Children's Hospital	United States	Palo Alto	CA
82	Klinikum rechts der Isar der Technischen Universität München	Germany	München	
83	Academisch Ziekenhuis Maastricht	The Netherlands	Maastricht	
84	Tel-Aviv Sourasky Medical Center	Israel	Tel Aviv	
85	Policlinico Universitario A. Gemelli	Italy	Roma	
86	Ospedale Casa Sollievo della Sofferenza	Italy	San Giovanni Rotondo	
87	Hospital Universitario La Paz	Spain	Madrid	
88	Hospital Sirio Libanes	Brazil	Sao Paulo	
89	Cleveland Clinic Abu Dhabi	United Arab Emirates	Abu Dhabi	
90	Mount Sinai Hospital	Canada	Toronto	
91	Universitätsklinikum Hamburg-Eppendorf	Germany	Hamburg	
92	Gangnam Severance Hospital - Yonsei University	South Korea	Seoul	

93	Centre Hospitalier Universitaire Vaudois	Switzerland	Lausanne	
94	Dignity Health - California Hospital Medical Center	United States	Los Angeles	CA
95	North York General Hospital	Canada	Toronto	
96	VCH - Vancouver General Hospital	Canada	Vancouver	
97	Yale New Haven Hospital	United States	New Haven	CT
98	Wooridul Spine Hospital	South Korea	Cheongdam-Dong	
99	Keio University Hospital	Japan	Tokyo	
100	Amsterdam UMC	The Netherlands	Amsterdam	
101	Emory University Hospital	United States	Atlanta	GA
102	Humber River Hospital	Canada	Toronto	
103	Kameda Medical Center	Japan	Kamogawa	
104	Allgemeines Krankenhaus der Stadt Wien - Medizinischer Universitätscampus	Austria	Wien	
105	Charing Cross Hospital	United Kingdom	London	
106	UZ Leuven - Campus Gasthuisberg	Belgium	Leuven	
107	Royal Melbourne Hospital - Parkville	Australia	Parkville	

108	Cambridge Medical Center	United States	Cambridge	MN
109	Istituto Giannina Gaslini	Italy	Genova	
110	Peter MacCallum Cancer Centre	Australia	Melbourne	
111	Hurley Medical Center	United States	Flint	MI
112	Baylor St. Luke's Medical Center	United States	Houston	TX
113	Mackenzie Richmond Hill Hospital	Canada	Richmond Hill	
114	UPMC Presbyterian & Shadyside	United States	Pittsburgh	PA
115	Universitätsklinikum Heidelberg	Germany	Heidelberg	
116	Moorfields Eye Hospital (City Road)	United Kingdom	London	
117	UMC Utrecht	The Netherlands	Utrecht	
118	Addenbrooke's	United Kingdom	Cambridge	
119	Geisinger Wyoming Valley Medical Center	United States	Wilkes Barre	PA
120	Royal Free Hospital	United Kingdom	London	
121	CHU Lille - Hôpital Claude-Huriez	France	Lille	
122	Seoul National University - Bundang Hospital	South Korea	Seongnam City	

123	Baycrest Centre	Canada	Toronto	
124	Mayo Clinic - Health System In Eau Claire	United States	Eau Claire	WI
125	Baptist Hospital of Miami	United States	Miami	FL
126	Adventhealth Orlando	United States	Orlando	FL
127	Rush University Medical Center	United States	Chicago	IL
128	Inselspital Bern	Switzerland	Bern	
129	Tampere University Hospital	Finland	Tampere	
130	University of Michigan Hospitals - Michigan Medicine	United States	Ann Arbor	MI
131	Hospices Civils de Lyon - Hôpital Lyon Sud	France	Pierre Benite	
132	UT Southwestern Medical Center	United States	Dallas	TX
133	UC San Diego Health - Jacobs Medical Center	United States	San Diego	CA
134	Children's Hospital of Philadelphia	United States	Philadelphia	PA
135	University of Utah Hospital	United States	Salt Lake City	UT
136	University of Wisconsin Hospitals	United States	Madison	WI
137	Klinikum der Universität München	Germany	München	

138	Rigshospitalet - København	Denmark	København	
139	Vanderbilt University Medical Center	United States	Nashville	TN
140	Cleveland Clinic - Florida	United States	Weston	FL
141	CHU Strasbourg - Hôpital Civil	France	Strasbourg	
142	Mercy Harvard Hospital	United States	Harvard	IL
143	Universitätsklinikum Schleswig-Holstein - Campus Kiel	Germany	Kiel	
144	Universitätsklinikum Bonn	Germany	Bonn	
145	Baylor Scott & White Medical Center	United States	Plano	TX
146	Agaplesion Diakonieklinikum Hamburg	Germany	Hamburg	
147	Akershus Universitetssykehus	Norway	Lørenskog	
148	Duke Regional Hospital	United States	Durham	NC
149	Geisinger Medical Center	United States	Danville	PA
150	KK Women's And Children's Hospital (KKH)	Singapore	Singapore	
151	King's College Hospital	United Kingdom	London	
152	Northwestern Memorial Hospital	United States	Chicago	IL

153	Clinica Universidad de Navarra	Spain	Pamplona/Iruña
154	Great Ormond Street Hospital	United Kingdom	London
155	Hospital Universitario Marqués de Valdecilla	Spain	Santander
156	Cliniques universitaires Saint-Luc	Belgium	Brussels
157	Deutsches Herzzentrum Berlin	Germany	Berlin
158	Agaplesion Markus Krankenhaus	Germany	Frankfurt am Main
159	Paracelsus-Klinik Golzheim Düsseldorf	Germany	Düsseldorf
160	Policlinico Universitario Campus Bio-Medico	Italy	Roma
161	AP-HP - Hôpital Henri-Mondor	France	Creteil
162	Mount Elizabeth Hospital - Novena	Singapore	Singapore
163	National University Hospital	Singapore	Singapore
164	Cleveland Clinic Fairview Hospital	United States	Cleveland OH
165	CHU Bordeaux - Groupe hospitalier Pellegrin	France	Bordeaux
166	King Abdulaziz Medical City	Saudi Arabia	Riyadh
167	Bumrungrad International Hospital	Thailand	Bangkok

168	Jewish Hospital - Mercy Health	United States	Cincinnati	OH
169	Hopital Americain	France	Neuilly Sur Seine	
170	OhioHealth Marion General Hospital	United States	Marion	OH
171	Universitätsklinikum Carl Gustav Carus Dresden	Germany	Dresden	
172	California Pacific Medical Center	United States	San Francisco	CA
173	UPMC Children's Hospital of Pittsburgh	United States	Pittsburgh	PA
174	Osaka University Hospital	Japan	Osaka	
175	Seattle Children´s Hospital	United States	Seattle	WA
176	University Hospitals Cleveland Medical Center	United States	Cleveland	OH
177	CHU Montpellier - Hopital Lapeyronie	France	Montpellier	
178	University of Washington Medical Center	United States	Seattle	WA
179	Hanyang University Medical Center	South Korea	Seoul	
180	Juntendo University Hospital	Japan	Tokyo	
181	Medizinische Hochschule Hannover	Germany	Hannover	
182	Les Hôpitaux Universitaires de Genève (HUG) - Cluse-Roseraie	Switzerland	Genève	

183	Max Super Speciality Hospital Saket	India	Delhi	
184	Royal Prince Alfred Hospital	Australia	Camperdown	
185	CHU Nantes - Site Hôtel-Dieu	France	Nantes	
186	ULB - Hôpital Erasme	Belgium	Brussels	
187	Luzerner Kantonsspital	Switzerland	Luzern	
188	Universitätsklinikum Freiburg	Germany	Freiburg	
189	Universitätsklinikum Tübingen	Germany	Tübingen	
190	Linz Kepler Universitätsklinikum	Austria	Linz	
191	Universitätsklinikum Mannheim	Germany	Mannheim	
192	Severance Hospital - Yonsei University	South Korea	Seoul	
193	Bellevue Hospital Center	United States	New York	NY
194	AP-HP - Hôpital Bichat-Claude-Bernard	France	Paris	
195	University of Kansas Hospital	United States	Kansas City	KS
196	Hadassah Ein Kerem Hospital	Israel	Jerusalem	
197	Hospital Clínico San Carlos	Spain	Madrid	

198	Nebraska Medicine - Nebraska Medical Center	United States	Omaha	NE
199	Centura Health-Avista Adventist Hospital	United States	Louisville	CO
200	Ajou University Hospital	South Korea	Suwon City	
201	The Alfred	Australia	Melbourne	
202	Claraspital	Switzerland	Basel	
203	Universitätsspital Basel	Switzerland	Basel	
204	A.O. Ospedali Riuniti Marche Nord - Presidio San Salvatore Centro	Italy	Pesaro	
205	Mouwasat Hospital Khobar	Saudi Arabia	Khobar	
206	BP – A Beneficência Portuguesa de São Paulo	Brazil	Sao Paulo	
207	Universitätsklinik Balgrist	Switzerland	Zürich	
208	Korea University - Anam Hospital	South Korea	Seoul	
209	BG-Unfallklinik - Unfallkrankenhaus Berlin	Germany	Berlin	
210	St. Michael's Hospital	Canada	Toronto	
211	Baylor University Medical Center	United States	Dallas	TX
212	Japanese Red Cross Medical Center	Japan	Tokyo	

213	Herlev Hospital	Denmark	Herlev	
214	Toronto East Health Network - Michael Garron Hospital	Canada	Toronto	
215	Rabin Medical Center	Israel	Petah Tikva	
216	Nippon Medical School Hospital	Japan	Tokyo	
217	AP-HM - Hôpital de la Timone	France	Marseille	
218	Grande Ospedale Metropolitano Niguarda	Italy	Milano	
219	University of Maryland Medical Center	United States	Baltimore	MD
220	Mediclinic City Hospital	United Arab Emirates	Dubai	
221	Kurashiki Central Hospital	Japan	Kurashiki	
222	Centro Cardiologico Monzino	Italy	Milano	
223	IEO - Istituto Europeo di Oncologia	Italy	Milano	
224	Texas Children's Hospital	United States	Houston	TX
225	Clinique Internationale Parc Monceau	France	Paris	
226	Hospital for Sick Children	Canada	Toronto	
227	Meyer - Azienda Ospedaliero Universitaria	Italy	Firenze	

228	Odense Universitetshospital	Denmark	Odense	
229	Novant Health Forsyth Medical Center	United States	Winston-Salem	NC
230	Bon Secours St. Francis Hospital	United States	Charleston	SC
231	Morristown Medical Center	United States	Morristown	NJ
232	Umass Memorial Medical Center	United States	Worcester	MA
233	Martini-Klinik am UKE	Germany	Hamburg	
234	Keck Hospital of USC	United States	Los Angeles	CA
235	Oulu University Hospital	Finland	Oulu	
236	Carolinas Medical Center	United States	Charlotte	NC
237	Metro Health Hospital	United States	Wyoming	WY
238	Princess Alexandra Hospital	Australia	Woolloongabba	
239	Foothills Hospital	United States	Boulder	CO
240	Provident Hospital of Cook County	United States	Chicago	IL
241	Essentia Health Virginia	United States	Virginia	MN
242	Johns Hopkins All Children's Hospital	United States	Saint Petersburg	FL

243	Tampa General Hospital	United States	Tampa	FL
244	Universitätsklinikum Erlangen	Germany	Erlangen	
245	Birmingham Children's Hospital	United Kingdom	Birmingham	
246	Sir Charles Gairdner Hospital	Australia	Nedlands	
247	Bon Secours DePaul Medical Center	United States	Norfolk	VA
248	OHSU Hospital	United States	Portland	OR
249	Jeroen Bosch Ziekenhuis	The Netherlands	's-Hertogenbosch	
250	Gold Coast University Hospital	Australia	Southport	

buildings, information technology infrastructure and EHRs. The hospitals on this list are the ones to watch.

David H. Freedman



LICENSING INFORMATION

If your hospital is listed above, [you can find out more about the licensing options visiting the Statista website.](#)

METHODOLOGY

The World's Best Smart Hospitals 2021 ranks the 250 medical institutions that are the world leaders in the use of smart technology. The ranking is based on a survey which included recommendations for hospitals in five categories: Digital Surgery, Digital Imaging, Artificial Intelligence, Telehealth and Electronic Medical Records. These recommendations came from both national and international sources. Statista's complex methodology ensures the quality and validity of the ranking.

The evaluation process took place in three steps:

Expert interviews: in-depth interviews with Smart Hospitals experts to generate questions and categories for the international survey

Hospital recommendations from peers: an international survey that resulted in more than 13,000 votes from doctors, hospital managers and health care professionals with knowledge of smart hospitals

Desk research (Quality Assurance): a review of every nominated hospital's advancements in the field of smart hospitals

For the full methodology, [download this file](#).

NOTE

One hospital has been removed from the list as it has been closed after the publication of this ranking.