

# RoboDoc: Surgery and the rise of the machines

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With shifts in demographics come opportunities for investment. An aging population has created a new potential for healthcare technology which is destined to become more prevalent and powerful over the coming decades.

The number of people aged 60 years and older is set to more than double by 2050 (962 million in 2017, 2.1 billion by 2050)<sup>1</sup>. It is estimated that global spending on healthcare will rise by 3% per capita on an annualised basis between 2014 and 2040<sup>2</sup>. Demographics and rising incomes imply more demand for healthcare, yet at the same time there is likely to be a shortage of doctors and nurses. Rising stresses within healthcare systems from pressure on doctor's time and the prospect of longer waiting lists are resulting in the increasing adoption of new technologies. These range from wearable devices to assist in patient monitoring in hospitals to robotic-assisted surgery. Advances in technology are also taking medical devices increasingly into therapy areas that were once only treatable with pharmaceuticals. This evolution toward new technologies is not just limited to the developed world either. Emerging Asia in particular is getting richer, older, and sicker (higher burden of chronic disease) as unhealthy lifestyles become more prevalent (obesity and pollution to name two). Consequently, many emerging countries are turning to new technologies as their healthcare systems evolve.

Focussing on robotics, the two emerging areas in healthcare over past five or more years have been in orthopaedics and general surgery robots. In orthopaedics, Stryker's Mako device has been a disruptor for hip and knee operations. Whilst cost is an important factor, so are the doctor's evaluation of service levels and technology. To this end the company has been successful in demonstrating the value of its robotic-assisted surgery, which has seen its devices penetrate a mature market.

Whilst far from perfect, surgery is a primary therapy for many conditions. Why is this not perfect? Complications and readmission rates remain surprisingly high, and variability in surgeon skill contributes to inconsistent patient outcomes. This is where robotic-assisted surgery makes for a compelling proposition in reducing variability and improving patient outcomes. In robotic-assisted surgery, Intuitive Surgical is arguably the global leader having launched their first iteration of the da Vinci robotic-assisted surgery system nearly 20 years ago. The system is used in a variety of surgeries including Hysterectomy, Colorectal and Hernia procedures.

On average a patient spends four nights in the hospital for an open surgery procedure whereas with Intuitive Surgical da Vinci system it is just one night. With hospitalisation being one of the most significant costs to a healthcare system, a reduction in the number of nights a patient is required to stay is an attractive value proposition for hospitals. There is also the implicit costs to an economy from a prospective loss of labour, with patients potentially able to return to work much earlier than for an open surgery procedure.

It's early days and only time will tell, but this relatively new and innovative field in medical technology may well prove an appealing long-term investment opportunity.

<sup>1</sup> United Nations, World Population Prospects: the 2017 Revision

<sup>2</sup> Dieleman, Joseph, et al, "Future and potential spending on health 2015–40: development assistance for health, and government, prepaid private, and out-of-pocket health spending in 184 countries", The Lancet, Volume 389, Issue 10083, 2005–2030