

# VR in Health Care Industry - Market Analysis Summary

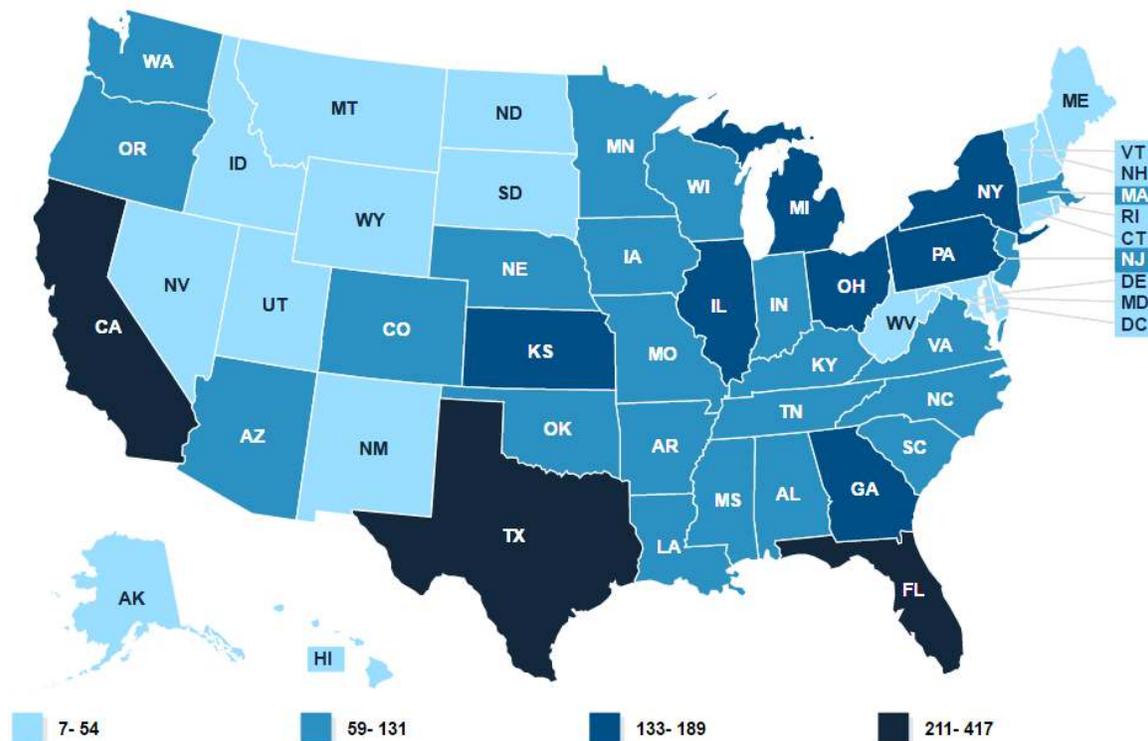
The following aspects will be examined:

- The U.S. healthcare industry
- The U.S. dental industry
- Pain-relief market
- Virtual reality market

## U.S. HEALTHCARE INDUSTRY

According to the American Hospital Association<sup>1</sup>, there are 5,627 hospitals across the U.S. Most of U.S. hospitals are non-profit facilities, while the rest are divided in nearly equal parts into for-profit or state/local government hospitals.

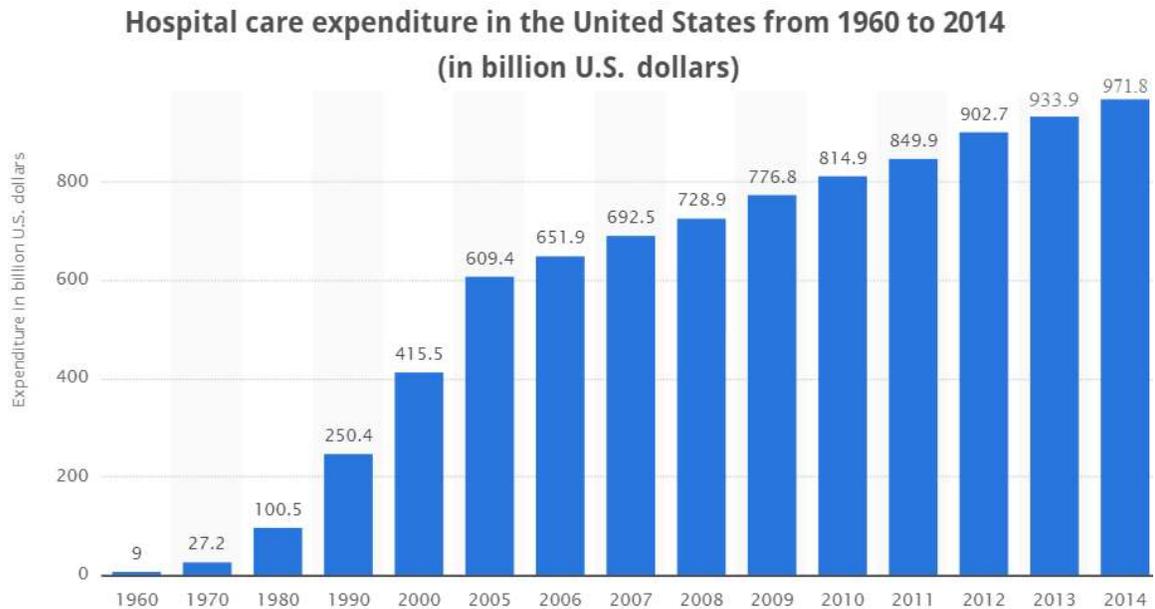
Texas, California, Florida, Illinois and Pennsylvania are the states with the highest number of hospitals with 417, 344, 211, 189 and 185, respectively<sup>2</sup>. The image above represents the geographical dispersion of hospitals across the U.S.



<sup>1</sup> <http://www.aha.org/research/rc/stat-studies/fast-facts.shtml>

<sup>2</sup> <http://kff.org/other/state-indicator/total-hospitals/>

The hospital care expenditure has been growing rapidly for the past decades. Since 2005, the total hospital care expenditure grew by ~4.5% per year, reaching 971 billion dollar in 2014<sup>3</sup>.



Hospital services are not cheap in the U.S. The average inpatient day is \$2,025 for nonprofit hospitals and \$1,629 for for-profit hospitals and the average length of stay for an acute-care hospital admission is 4.8 days<sup>4</sup>.

## U.S. DENTAL INDUSTRY

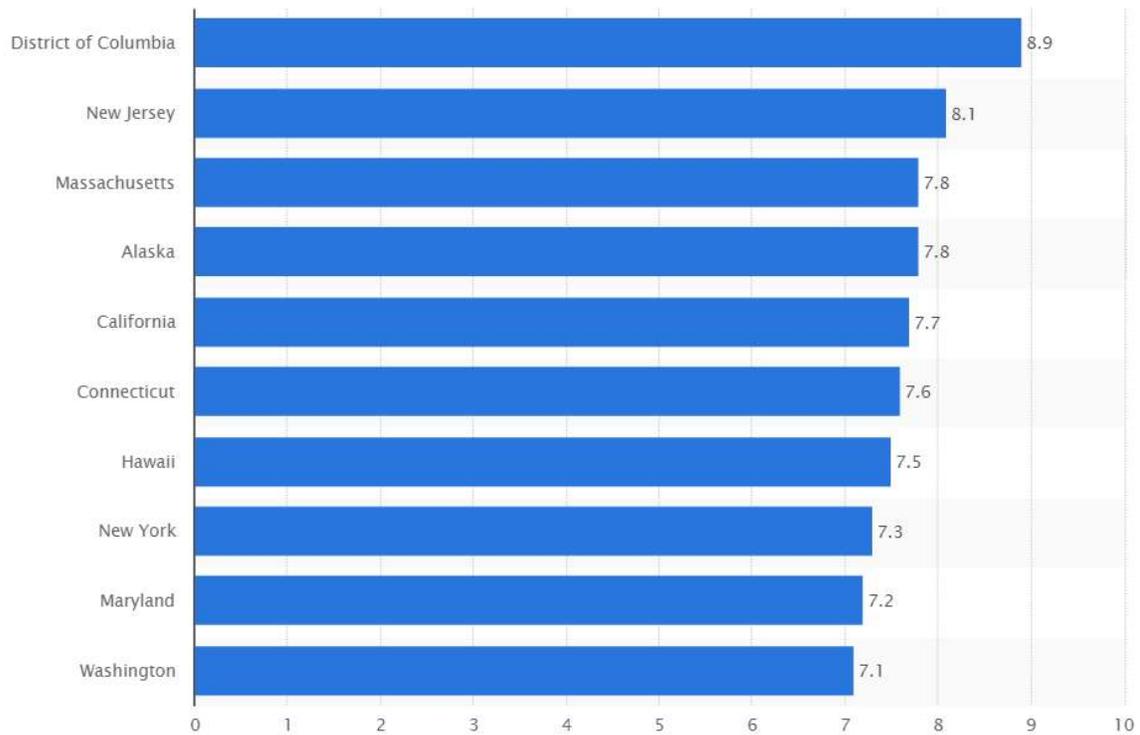
According to KFF<sup>5</sup>, there are 210,030 professionally active dentists in the U.S. The countries with the most dentists are California (33K), NY (16K), Texas (15K) and Florida (11K).

<sup>3</sup> <https://www.statista.com/statistics/184772/us-hospital-care-expenditures-since-1960/>

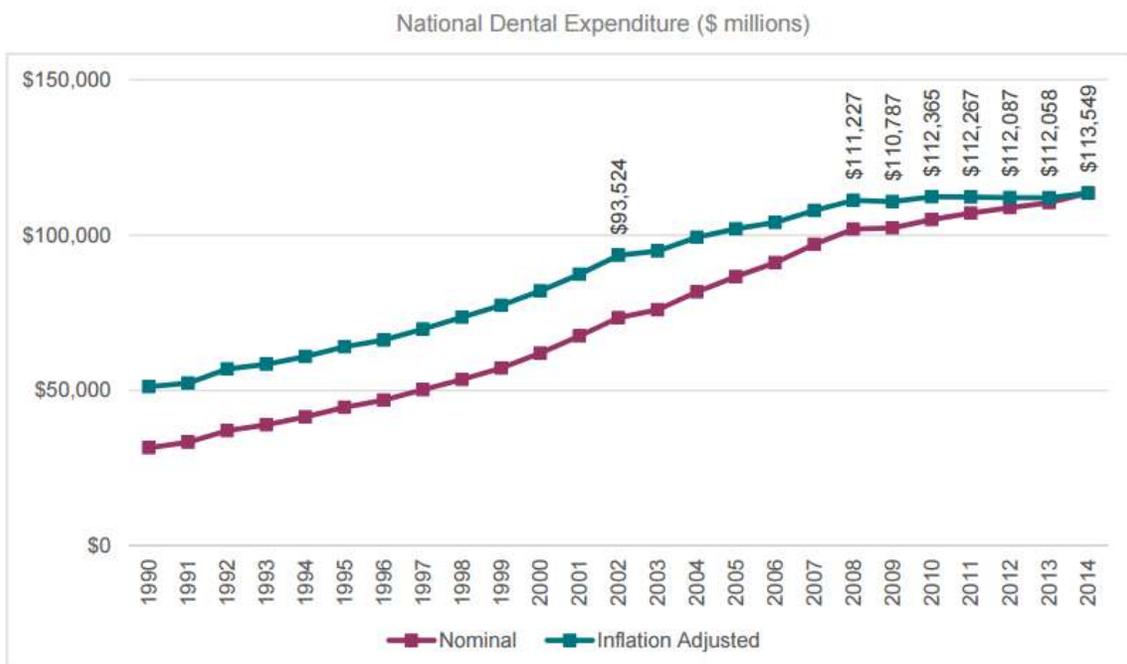
<sup>4</sup> <http://www.beckershospitalreview.com/hospital-management-administration/50-things-to-know-about-the-hospital-industry.html>

<sup>5</sup> <http://kff.org/other/state-indicator/total-dentists/>

### Top 10 U.S. states by number of active dentists per 10,000 civilian population in 2013



In 2014, national dental expenditure in the U.S was \$113.5 billion, a minor increase from 2013 \$112.



**Source:** Centers for Medicare and Medicaid Services; U.S. Bureau of Economic Analysis. **Note:** National dental expenditure adjusted for inflation using the GDP implicit price deflator. Inflation-adjusted figures in 2014 dollars.

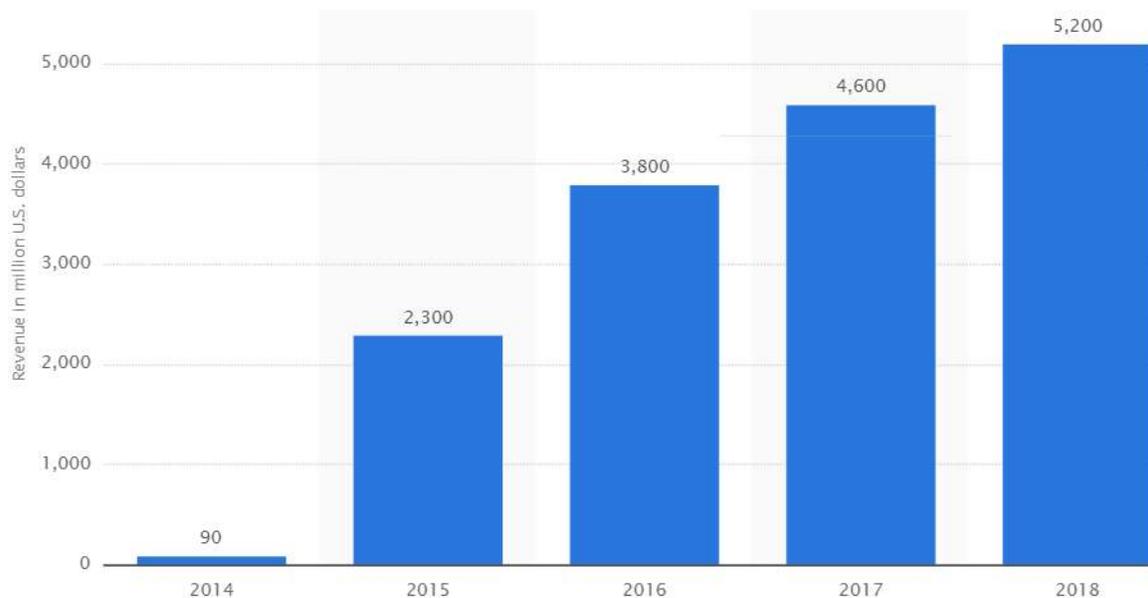
## PAIN-RELIEF MARKET

Current treatments for pain mainly include non-steroidal anti-inflammatory drugs ("NSAIDs") for mild to moderate pain, and opioids, such as morphine, for moderate to severe and chronic pain.

The global pain management market for pharmaceuticals and medical devices was worth \$36.6bn in 2014<sup>6</sup>. The market for NSAIDs drugs was worth \$11.4bn in 2014. Growth in this segment is driven by an ageing global population, the increased incidence of obesity and changing attitudes towards pain management

## VIRTUAL REALITY MARKET

The VR industry is growing at a fast pace, with revenues from virtual reality products (both hardware and software) projected to increase from 90 million U.S. dollars in 2014 to 5.2 billion U.S. dollars in 2018<sup>7</sup>.

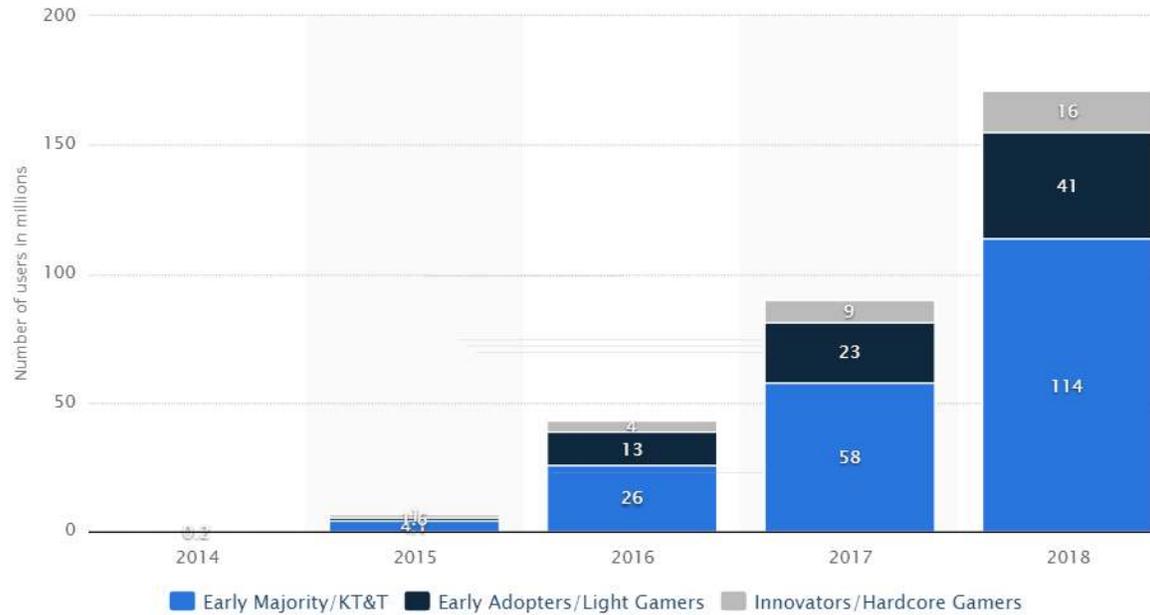


The number of active VR users is forecast to reach 171 million by 2018<sup>8</sup>.

<sup>6</sup> [http://www.futuramedical.com/content/products/pain\\_relief.asp](http://www.futuramedical.com/content/products/pain_relief.asp)

<sup>7</sup> <https://www.statista.com/statistics/426276/virtual-reality-revenue-forecast-worldwide/>

<sup>8</sup> <https://www.statista.com/statistics/426469/active-virtual-reality-users-worldwide/>



## Virtual Reality in the Medical Sector

It's still a new and experimental approach, but proponents of virtual reality say that it can be an effective treatment for everything from intense pain to Alzheimer's disease to arachnophobia to depression. As Facebook, Sony, HTC and others race to build a dominant VR set, the price of hardware has fallen, making the equipment a more affordable option for hospitals looking for alternatives for pain relief.

In a research done at Shriners and Harborview Burn Center, patients reported less discomfort. The doctors examined magnetic resonance imaging (MRI) scans of patients' brains, which showed they actually experienced less pain. Brennan Spiegel, a gastroenterologist at Cedars-Sinai said that he's experienced a range of reactions. Older patients tend to be less open to it than younger ones. One terminal patient refused to even consider it. One woman, who suffered abdominal pain, got such immediate relief that she went home and bought herself a headset.

A VR video game from the University of Washington called SnowWorld<sup>9</sup>, which involves throwing snowballs at penguins and listening to Paul Simon, could alleviate pain during tasks that can be excruciating, like wound care or physical therapy, by overwhelming the senses and pain pathways in the brain. A 2011 study the military conducted showed that for soldiers with burn injuries from IED blasts, etc. SnowWorld worked better than morphine.

<sup>9</sup> <http://www.hitl.washington.edu/projects/vrpain/>

The economics may make VR an attractive experiment for some hospitals. Hospital care takes up to about 30% of the U.S. annual \$3 trillion in health-care spending, making it the most costly category of treatment. The price of a headset and software is tiny compared to the expense of keeping a patient in the hospital for an extra day.