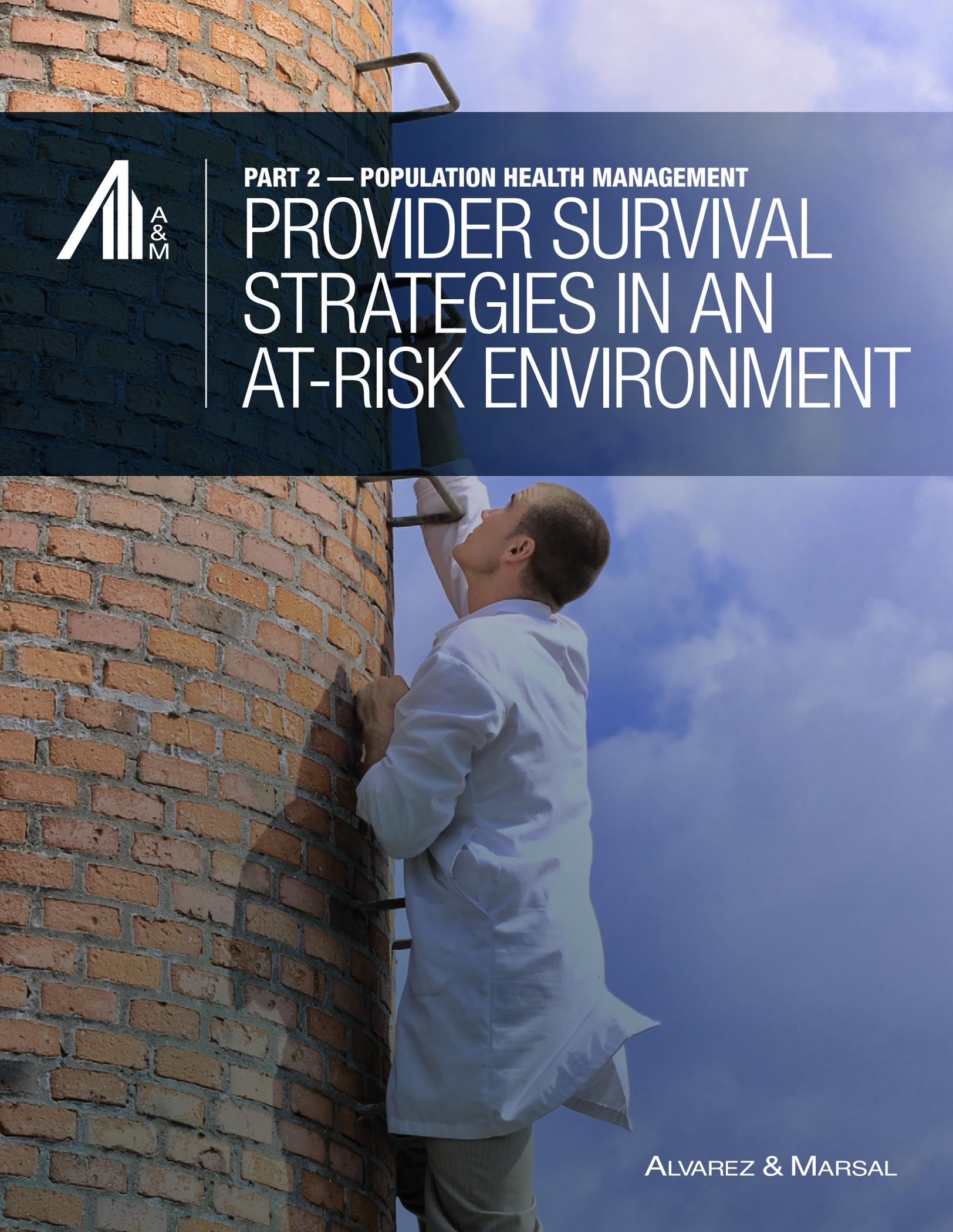




PART 2 — POPULATION HEALTH MANAGEMENT

PROVIDER SURVIVAL STRATEGIES IN AN AT-RISK ENVIRONMENT



ALVAREZ & MARSAL

For all inquiries, please contact:
David Gruber, MD, MBA
Managing Director and Director of Research
+1 212 763 9801
dgruber@alvarezandmarsal.com

Provider Survival Strategies in an At-Risk Environment – Full Report

October 2017

In this compilation of a six-part series, A&M is focused on providing context for the actions deemed necessary by providers to succeed in an increasingly at-risk, value-based environment. All healthcare is local. Siloed activities now require convergent integration. Each provider needs to consider federal (Medicare) and state (Medicaid) reimbursement and regulatory initiatives, local market conditions such as demographics, socioeconomics, competitive intensity, market share and relative performance, and its own capabilities and risk profile.

<https://www.alvarezandmarsal.com/insights/provider-survival-strategies-risk-environment>



POPULATION HEALTH MANAGEMENT

The original Kindig and Stoddart definition of population health, published in 2003, focused on the health outcomes of a group of individuals, as well as the distribution of outcomes within the group. A&M and others believe that a focus on the entire population, which includes the 50 percent of Americans accounting for 3 percent of costs, results in a diffusion of effort. Our definition of population health is focused on the 5–10 percent of the population accounting for 43–68 percent of costs.

Managing population health requires consideration of clinical, behavioral and social determinants of health; depression and activity limitations independently increase the costs of care. Population health management is a highly data-dependent endeavor focused on patient

stratification into clinically meaningful subgroups and longitudinal, multiyear costs, outcomes and gaps in care. Fully 43 percent of high-cost patients in the 90th percentile of spending will be in the same percentile of spending the following year. Population health management requires translation to the individual patient through case management and patient (caregiver) engagement. Population-based metrics (e.g., admissions per 1,000 population) are diametrically opposite to those in a fee-for-service system (e.g., average daily census). Barriers to implementation include an inadequate data and analytics infrastructure, lack of performance transparency and an unwillingness to factor site of service cost differentials into the analysis.

POPULATION HEALTH TARGETING THE 5–10 PERCENT

A survey by the Milken Institute of Public Health at George Washington University in 2015 identified only two of 37 (5.4 percent) surveyed executives using the original definition of population health focused on the “health outcomes of a group of individuals,” as defined by David Kindig, M.D., PhD, and Greg Stoddart, PhD, in 2003. Other surveyed executives reference specific considerations such as costs, the target population (“community, a group of employees, insurance plan enrollees, etc.”), proactive intervention (prevention), care delivery and/or redesign (disparity, provider variation, value-based, primary care-centric model, evidence-based and “silo-focused to a communal effort”), the care continuum, individual responsibility, social determinants, “population longevity and quality of life,” continuous improvement of operational activities, measurement, the Triple Aim and “taking an analytical approach.”⁴⁶ Alvarez & Marsal incorporates elements of the Kindig and Stoddart definition, while adding cost and management considerations to the focused target population accounting for the majority of healthcare expenditures.

Our target population is most concentrated for Medicaid and least concentrated for Medicare. It is not always possible to proactively identify the highest-cost patients within each payer group, but epidemiologic data certainly allows for the identification of high-cost and/or high-risk conditions (e.g., cancer, extremely pre-term and mild-to-moderate dementia) requiring care delivery redesign to improve efficiency and effectiveness. It’s also important to note that 50 percent of the population accounts for only 3–5 percent of costs and, as a result, are not the primary focus of population health efforts.

FIGURE 20 | DEFINITION OF POPULATION HEALTH

KINDIG AND STODDART¹

“The health outcomes of a **group of individuals**, including the distribution of such outcomes within the group. It is an approach to health that aims to improve the health of the entire human population”



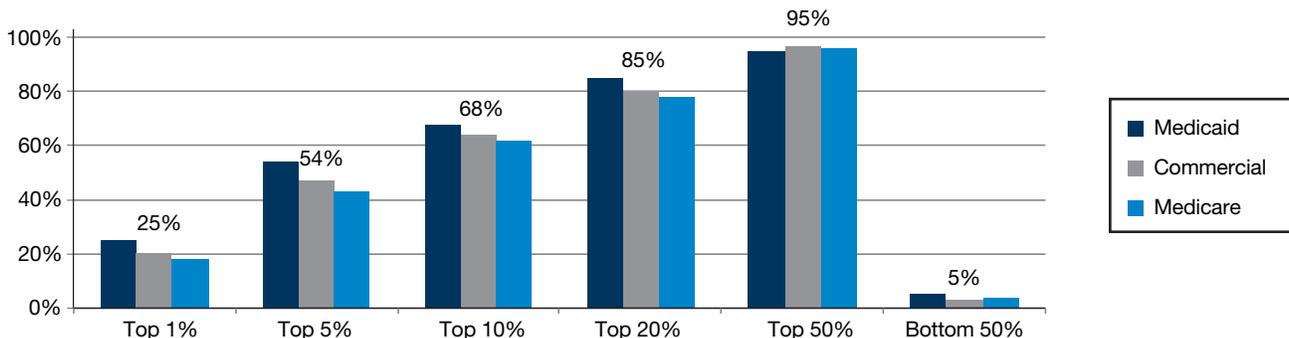
ALVAREZ & MARSAL

“The health and cost outcomes of a group of individuals, including the distribution of such outcomes within the group. It is an approach to health management that aims to improve the efficiency and effectiveness of healthcare delivery for the 5-10% of the population accounting for 43-68% of costs”



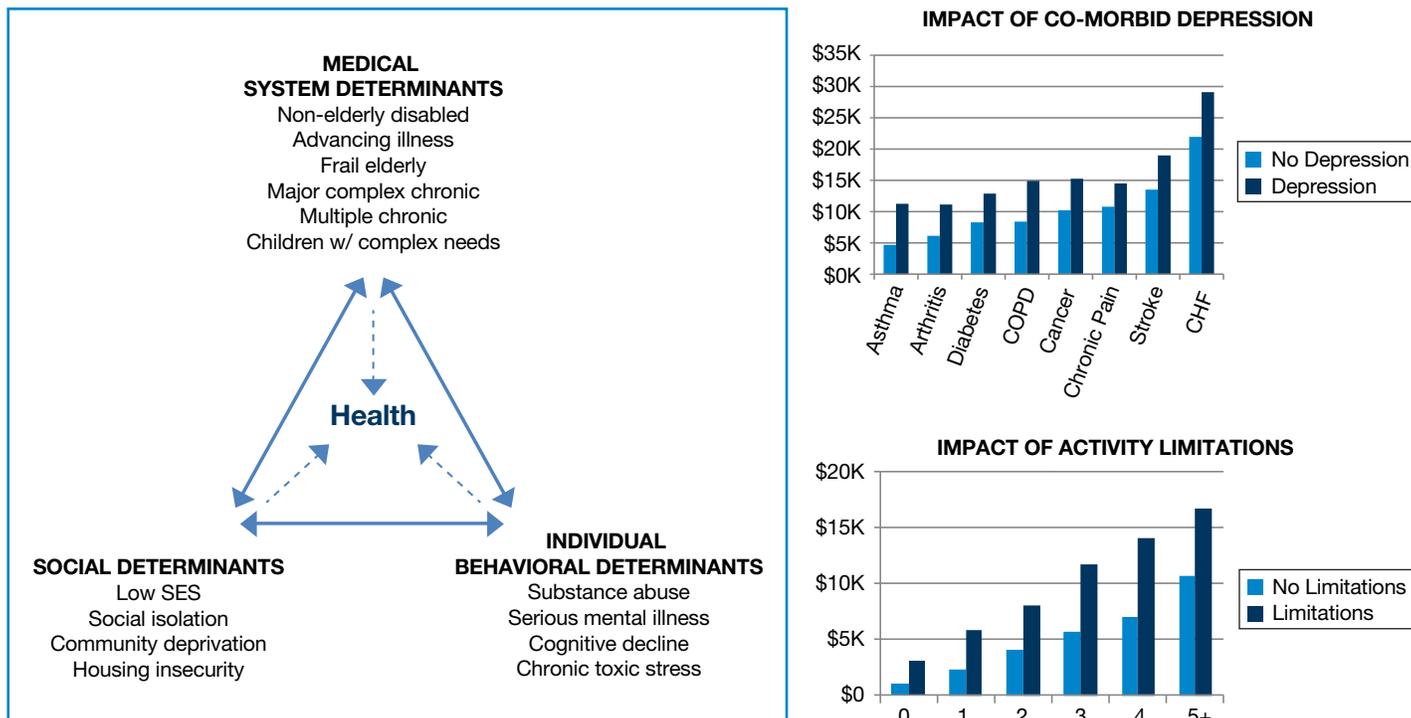
Source: Kindig D, Stoddart J. *Models for Population Health*; *American Journal of Public Health* 2003, 90(3): 380-383

FIGURE 21 | POPULATION STRATIFICATION BY PAYER BASED ON EXPENDITURES



Source: Medicaid – CMS FY2008; Commercial - Kaiser Family Foundation calculations using data from U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey (MEPS), 2008.; Medicare – CMS 2001

FIGURE 22 | MEDICAL, BEHAVIORAL AND SOCIAL DETERMINANTS OF COSTS



Sources: ¹Medical Expenditure Panel Survey, 2006. RWJF, Bloomberg School of Public Health Chronic Disease Chart Book; ²Milliman Research Report. Chronic conditions and co-morbid psychological disorders, July 2008. Excludes incremental behavioral health treatment costs of \$90-170 per condition

The total cost of whole person care reflects medical system, behavioral and social determinants. Medical system determinants often reflect treatment by multiple providers at several sites, including the community, and the need for care coordination, data sharing and integration across the entire care continuum.

Individual patients with comorbid depression costs, on average, are 53 percent higher (range: 34–141 percent) than those with a chronic condition or cancer alone.⁴⁷ The risk of depression in patients with a serious medical condition is estimated at 25–33 percent.⁴⁸ Patient fears associated with chronic and life-threatening illness include loss of control and self-image, the expression of anger, dependency, stigma, isolation, abandonment and death.⁴⁹

The rate of depression varies by the type of condition (e.g., heart attack, stroke, cancer), its lifecycle and severity, presence of comorbidities, impact on functional status, degree of psychosocial support and whether the condition is life-threatening or terminal.

Activity limitations such as walking, climbing stairs, bending, and standing or sitting for extended periods have also been shown to be an independent driver of costs. Arthritis, injury and depression are among the common causes of activity limitations.

Social determinants also affect healthcare costs. Nonmedical risk factors contributing to the underlying emotional state and health outcome include income (affordability), social isolation (psychosocial status), bereavement, retirement, job loss (employment status), relocation and substance abuse.

The aged and disabled represent 25 percent of Medicaid enrollees, but account for 66 percent of Medicaid costs.⁵⁰ The vast majority of Medicare spending occurs in people with multiple complex chronic conditions.⁵¹ The frail elderly often require community services to facilitate independent living. End-of-life care is exceedingly expensive, with 2012 Medicare decedents representing 3.7 percent of Medicare beneficiaries, but accounting for 27.3 percent, \$165 billion of total Medicare program expenditures (excluding decedent deductibles and co-payments).⁵²

FIGURE 23 | CLINICAL GROUPS WITH DISPROPORTIONATE SPENDING

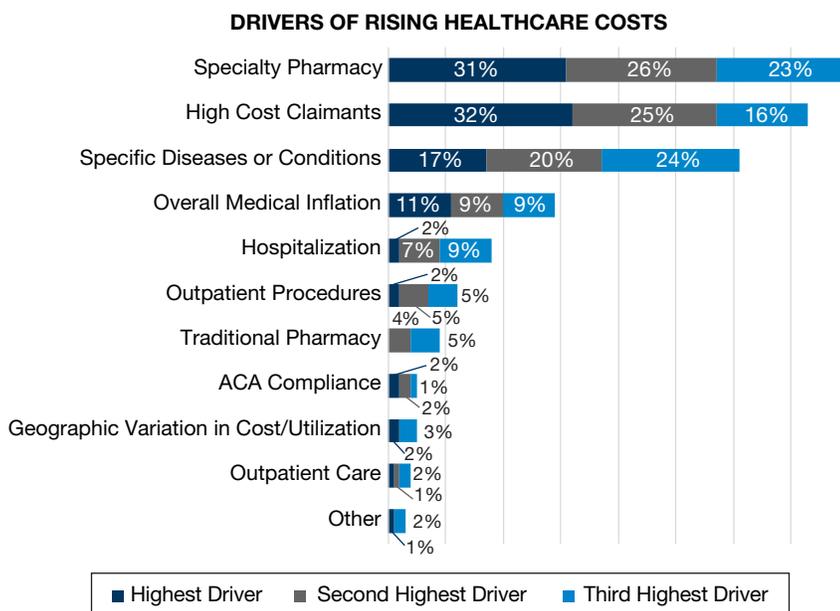
CLINICAL GROUP	FEATURES	% OF MEDICARE BENEFICIARIES	ESTIMATED NUMBER OF MEDICARE BENEFICIARIES
Children with complex needs	Have sustained severe impairment in at least four categories together with enteral/parenteral feeding or sustained severe impairment in at least two categories and requiring ventilation or continuous positive airway pressure	0.7%	400,000 (with cost approximating \$250,000 per child)
Non-elderly disabled	Under 65 years and with end-stage renal disease or disability based on receiving Supplemental Security Income	18%; End Stage Renal Disease (ESRD) – 0.5 million	9.9 million
Multiple chronic	Only one complex condition and/or between one and five non complex conditions	32% with 2-3 chronic conditions; 23% with 4-5 chronic conditions	17.8 million with 2-3 chronic conditions; 12.8 million with 4-5 chronic conditions
Major complex chronic	Over 65 years and with two or more frailty indicators	14%	6.4 Million
Advancing illness	Other terminal illness, or end of life	4%	2.1 Million

CHRONIC ILLNESSES	
Categories for children with complex needs	Learning and mental functions, communication, motor skills, self-care, hearing, vision
Noncomplex conditions	Benign prostatic hyperplasia, endocrine and metabolic disorders, eye disease, hematological disease, hypertension, immune disorders, inflammatory bowel disease, neuromuscular disease, thyroid disease, substance abuse, etc.
Complex conditions	Acute myocardial infarction, ischemic heart disease, chronic kidney disease, congestive heart failure, dementia, chronic lung disease, psychiatric disease, specified heart arrhythmias, stroke, diabetes
Frailty indicators	Gait abnormality, malnutrition, failure to thrive, cachexia, debility, difficulty walking, history of fall, muscle wasting, muscle weakness, decubitus ulcer, senility, or durable medical equipment use



Source: <http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Chronic-Conditions/Downloads/2012Chartbook.pdf>

FIGURE 24 | DRIVERS OF EMPLOYER COSTS



RISK FACTOR	U.S. AVERAGE (ADULTS)
LDL>130 mg/dl	31.7% ¹
HDL<40 mg/dl	19.1%
Triglycerides	31.0%
Hypertension> 140/90	18-39: 6.8% 40-59: 30.4% 60+: 66.7%
Pre-diabetes: Impaired Fasting Glucose (100-126 mg/dl) or Hemoglobin A1C (5.7-6.4 mg/dl)	33.0%
Metabolic Syndrome	34.7%
Obesity (BMI >30)	35.7%
Severe(morbid) obesity (BMI>40)	6.3%
Diabetes	9.3% diabetic; 72% diagnosed

Source: <http://www.cnbc.com/2016/08/11/expect-your-health-insurance-costs-to-rise-in-2017.html>

Employer costs are driven by specialty pharmacy, high-cost claimants and specific diseases and conditions — the latter including the obesity-diabetes-comorbidity continuum, musculoskeletal conditions, behavioral health (substance abuse) and cancer. High-cost claimants may also include trauma, moderate-to-severe prematurity and conditions such as autoimmune disease, multiple sclerosis and hemophilia that are treated with very expensive specialty drugs. Specialty drug spending in five categories alone — oncology, autoimmune disease, HIV, multiple sclerosis and hepatitis C — increased from \$63.9 billion in 2012 to \$135.9 billion in 2016, reflecting a compound annual growth rate of 20.8 percent.⁵³ The specialty drug market is forecast to increase from \$87 billion in 2012 to \$402 billion in 2020.⁵⁴ Population health includes a focus on the total cost of care, inclusive of care redesign, site of service and drug price control strategies (prior authorization, step therapy, formulary tiers, closed pharmacy networks, etc.). Population health is also focused on opportunities for prevention, i.e., risk factor modification, particularly in the high-cost and moderate-to-high-risk population.

Population health is data-driven and requires the analysis of retrospective claims to identify the target population, resource utilization and unit pricing, wherever possible. A total cost of care analysis is required, inclusive of facility, outpatient, community-based and pharmacy costs. Case management principles are applied to the highest-cost patients. Provider interventions facilitating patient activation and behavior change are essential to self-management.

Opportunities to create value not only include process re-design, but also reducing the total cost of care, i.e., selecting the appropriate provider and site of service.

Unlike other sectors of the economy, the lack of price transparency, combined with third party payments for services and, until recently, limited out-of-pocket consumer costs has resulted in significant provider and service line price variation.⁵⁵ Higher commercial insurance prices reflect a multitude of factors, including provider market share, brand equity, competitive intensity, referral patterns, ownership status, cost structure and, importantly, the ability and negotiating position relative to payers — and rarely reflect a differential in health outcomes.

FIGURE 25 | POPULATION HEALTH, CASE MANAGEMENT AND PATIENT ENGAGEMENT

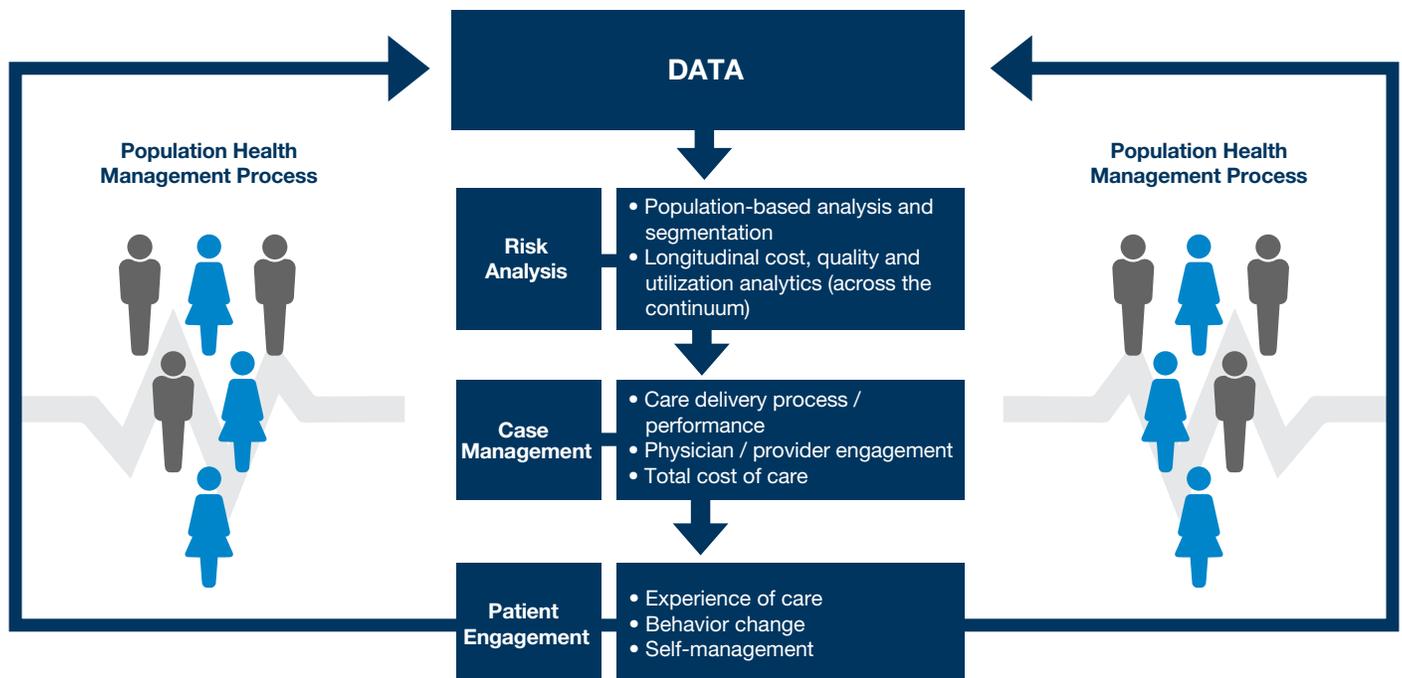
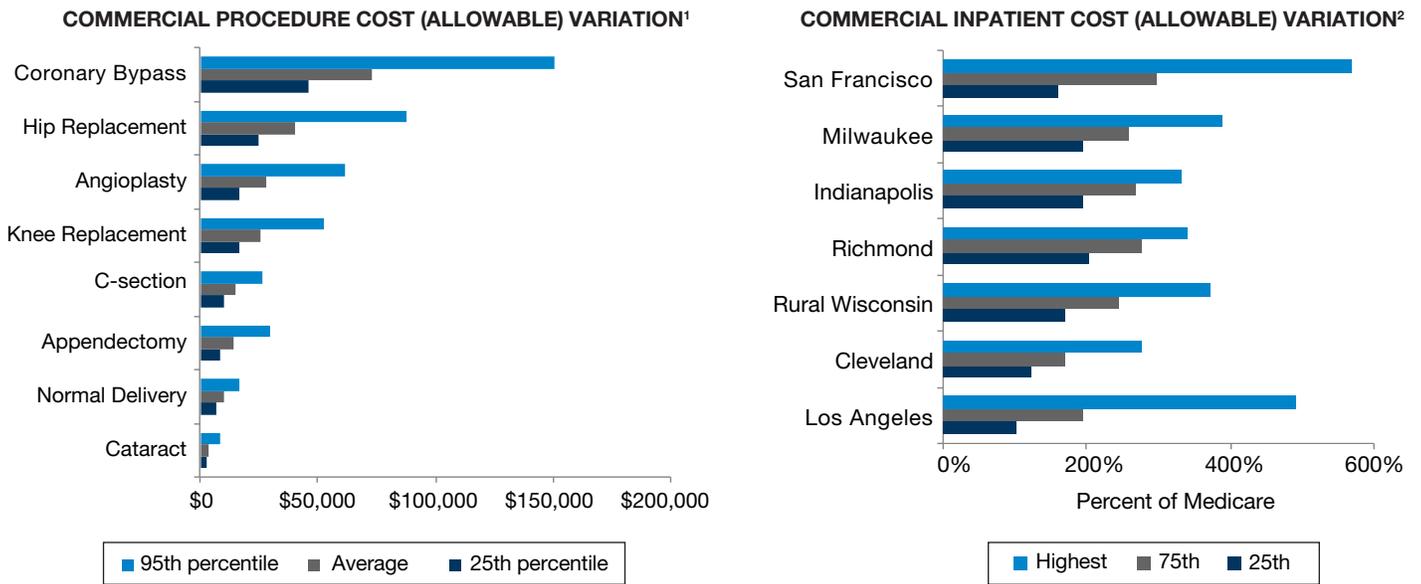


FIGURE 26 | VARIATION IN PROVIDER UNIT COSTS



¹International Federation of Health Plans. 2012 Comparative Price Report: Variation in Medical and Hospital Prices by Country; April 2013. U.S. data based on 100 million claims; ²Center for Studying Health System Change. Wide variation in hospital and physician payment rates evidence of provider market power. Research brief #16, November 2010.

A wide variation in commercial inpatient and outpatient payment rates exists within specific markets, thereby creating an opportunity for narrow(er) networks and reference-based pricing (as a percentage of Medicare above which the consumer pays 100 percent of the incremental cost) to attenuate rising costs. Nationally, in 2010, inpatient payment variation was shown to be widest in California (San Francisco and Los Angeles), where the price variance between the 25th and 75th percentile of hospitals is 150 percent to 250 percent of the Medicare payment rate, and the lowest in Ohio (Cleveland).⁵⁶

The total cost of care also reflects variation in provider resource utilization. Medicare hospital and nursing home admissions, as well as home care visits and the use of hospice services varies dramatically by state (and local markets) for beneficiaries >65 years. The difference between the first and fourth quartile is 2–4 times, a differential not shown to be equated with enhanced outcomes.

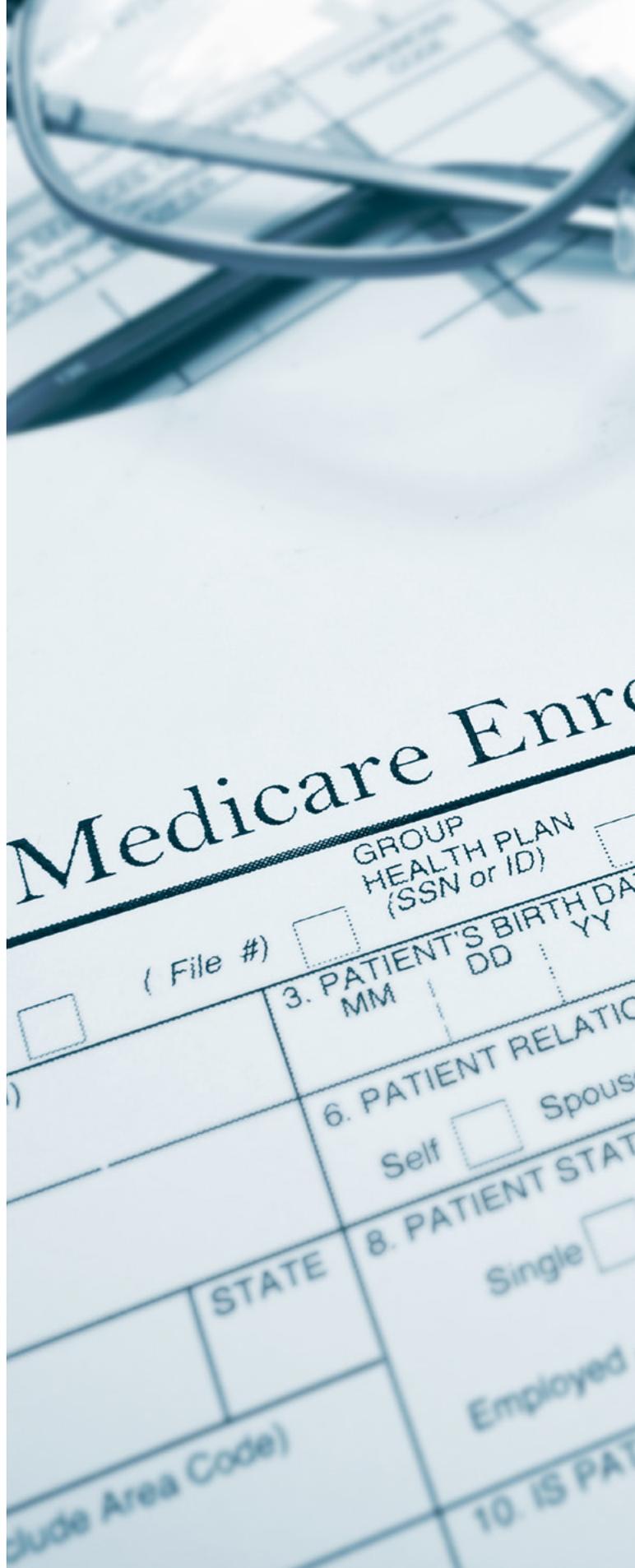
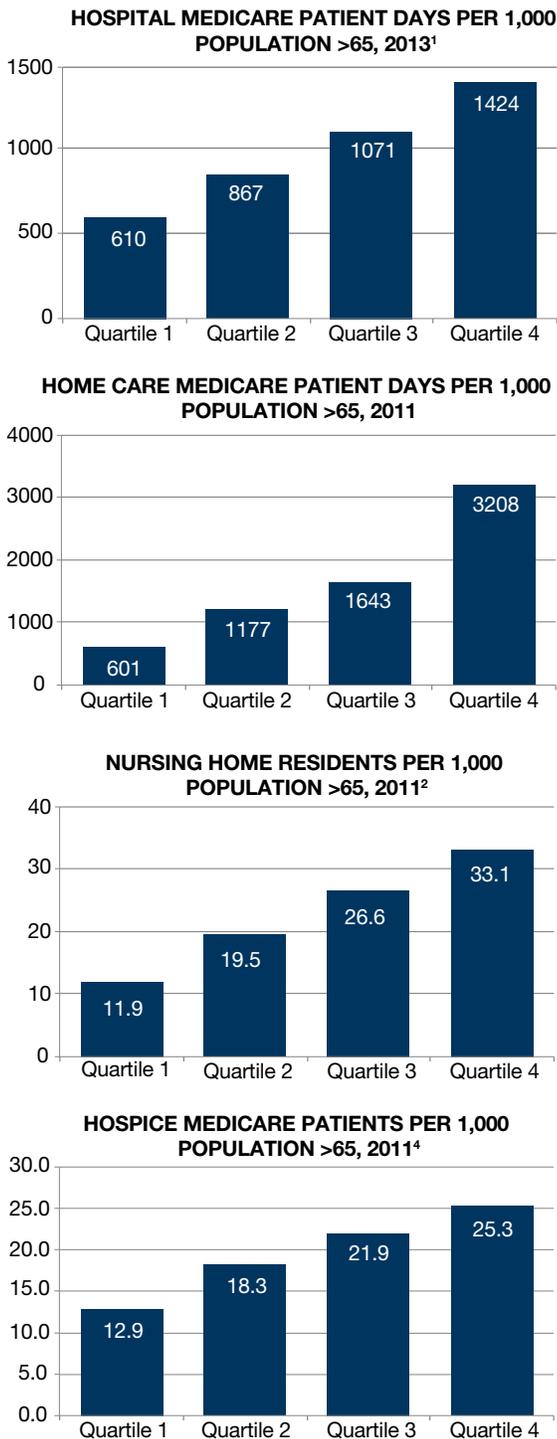
In July 2013, The Institute of Medicine (IOM) published a seminal report entitled “Variation in Healthcare Spending: Target Decision Making, Not Geography” and found that higher spending in Medicare primarily comes from the “variation in utilization of post-acute care services and, to a lesser extent, by variation in the utilization of acute care services.”⁵⁷ The report was published following more

than 20 years of evidence generated by the Dartmouth Atlas of Healthcare, highlighting significant variation in Medicare FFS spending (by state, metropolitan statistical area, hospital referral region, hospital and type of service) without an apparent relationship to clinical outcomes.⁵⁸

The IOM Committee calculated a Medicare fee-for-service spending variation of 42 percent, a figure consistent with Medicare Advantage data that suggests a variation of 36–50 percent. Post-acute care service providers account for 73 percent of the total variation in spending. The impact of reducing the differential utilization of other healthcare services among Medicare FFS recipients, such as diagnostic tests, procedures and prescription drugs, was minor.

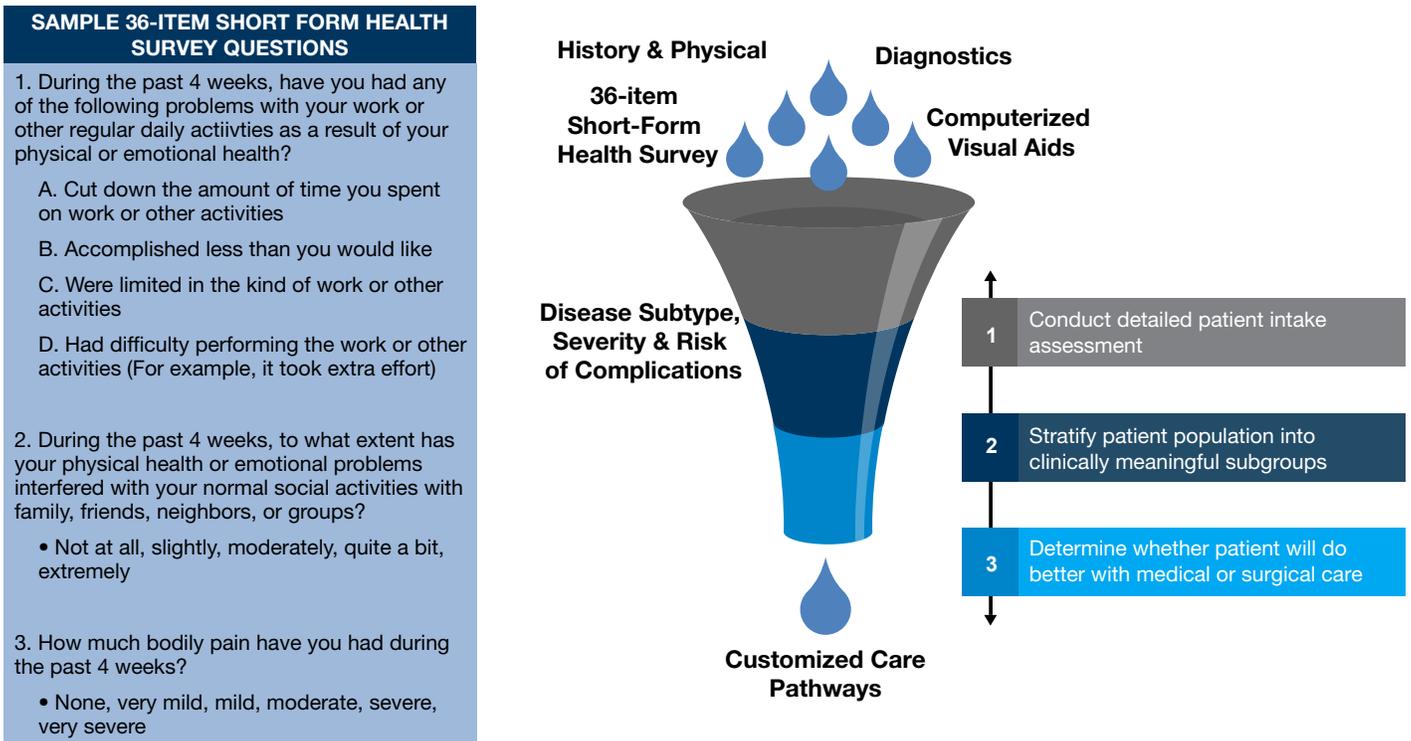
Acute and post-acute care facility costs per day vary widely, with hospitals being the most expensive, followed by long-term acute care hospitals, inpatient rehabilitation facilities and skilled nursing facilities; home care, a non-facility service, is the least expensive.⁵⁹ Opportunities exist for a reduction in ambulatory care-sensitive hospitalizations, as well as earlier intervention to reduce the intensity of required care. The possibility of payment reform, inclusive of site neutral reimbursement, has increased focus on facility price disparities, patient mix and entry criteria, length of stay and outcome differentials, if any.

FIGURE 27 | VARIATION IN PROVIDER MEDICARE RESOURCE UTILIZATION



¹Hospitals – Medicare Cost Reports via Truven Healthcare. 2013 data; ²Nursing home: 2011 data. <http://kff.org/other/state-indicator/number-of-nursing-facility-residents/> ³Home health – 2011 data. <http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/MedicareFeeorSvcPartsAB/downloads/HHAst11.pdf> ⁴Hospice - 2011 data. <http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/MedicareFeeorSvcPartsAB/Downloads/HOSPICE11.pdf>

FIGURE 28 | CASE STUDY: DARTMOUTH SPINE CENTER



Source: http://www.rand.org/health/surveys_tools/mos/36-item-short-form/survey-instrument.html; *The Four Habits of High-Value Health Care Organizations*

The application of population health principles, inclusive of costs, represents a conundrum for many healthcare systems. Low back pain of >24 hour duration is exceedingly common, affecting 17.0 million adults; 7.9 million have a duration exceeding three months, with 54 percent reporting activity limitations.^{60,61} Despite limited clinical evidence, surgical treatment of low back (lumbar) degenerative disc disease increased 2.4 times in 2000–2009 and is most pronounced in the Midwest and South.⁶² The clinical data comparing fusion surgery to nonsurgical alternative treatments is mixed; several trials “suggested no substantial difference in disability scores at 1-year and 2-years”.⁶³ An interesting study by a neurosurgeon highlighted the importance of surgical criteria, as she found 17.4 percent of cases recommended for surgery as unnecessary, i.e., pain “without neurological deficits and without significant abnormal radiographic findings.”⁶⁴ A few orthopedic procedures such as vertebroplasty and (knee) meniscal repair have been shown to be of limited clinical value.^{65,66}

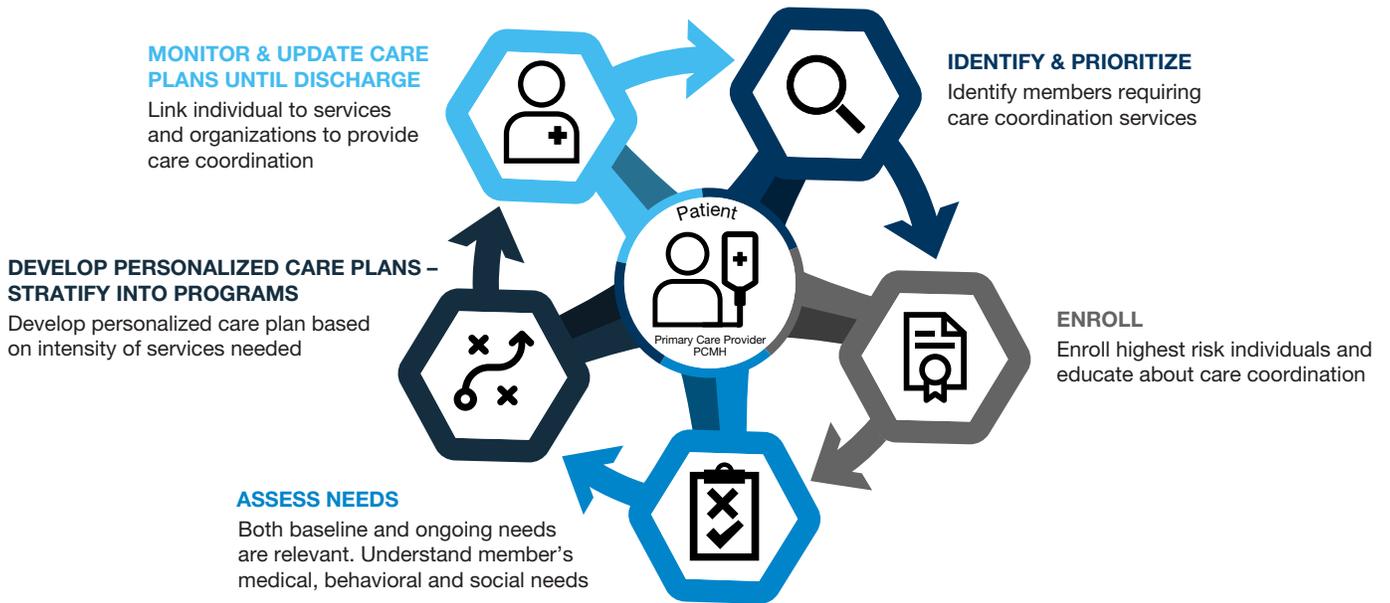
Orthopedic surgery is usually the most profitable major service line for a hospital. Orthopedic surgeons, and, in particular, spinal specialists are among the highest-compensated physicians.⁶⁷ An increased focus on

nonsurgical treatment alternatives, when appropriate, would reduce overall health system (and physician) revenues. Such a focus may also allow health systems to attract new members (i.e., gain market share) in an at-risk, value-based ecosystem.

Population health initiatives and related findings require translation to the individual patient. High-cost and/or high-risk patients may require case management and personalized health plans incorporating the services of other providers, community resources and/or caregivers. Transitions between facilities and/or to the home pose additional challenges.

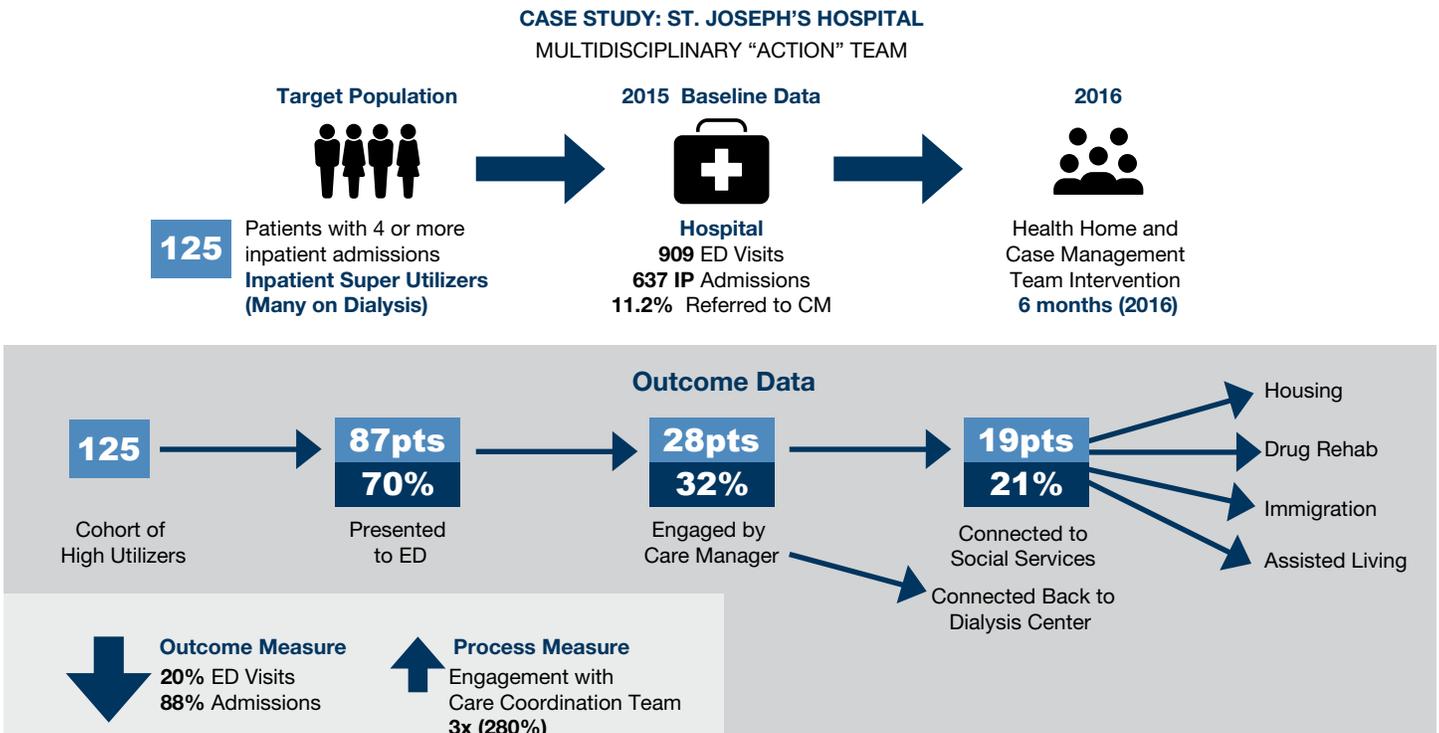
A case study from St. Joseph’s Hospital, a member of the Montefiore Hudson Valley Collaborative in New York State, is illustrative. The collaborative is led by Montefiore, includes 250 providers and other organizations from seven counties and “champions new models of providing Medicaid beneficiaries with higher quality care, while reducing expenditures through enhanced coordination, community-focused care, and education.”⁶⁸ The target population was identified, the case management team activated and outcomes measured.

FIGURE 29 | TRANSLATION OF POPULATION HEALTH TO THE INDIVIDUAL PATIENT



Source: Montefiore Hudson Valley Collaborative

FIGURE 30 | CASE STUDY: ST. JOSEPH'S HOSPITAL



Source: Montefiore Hudson Valley Collaborative

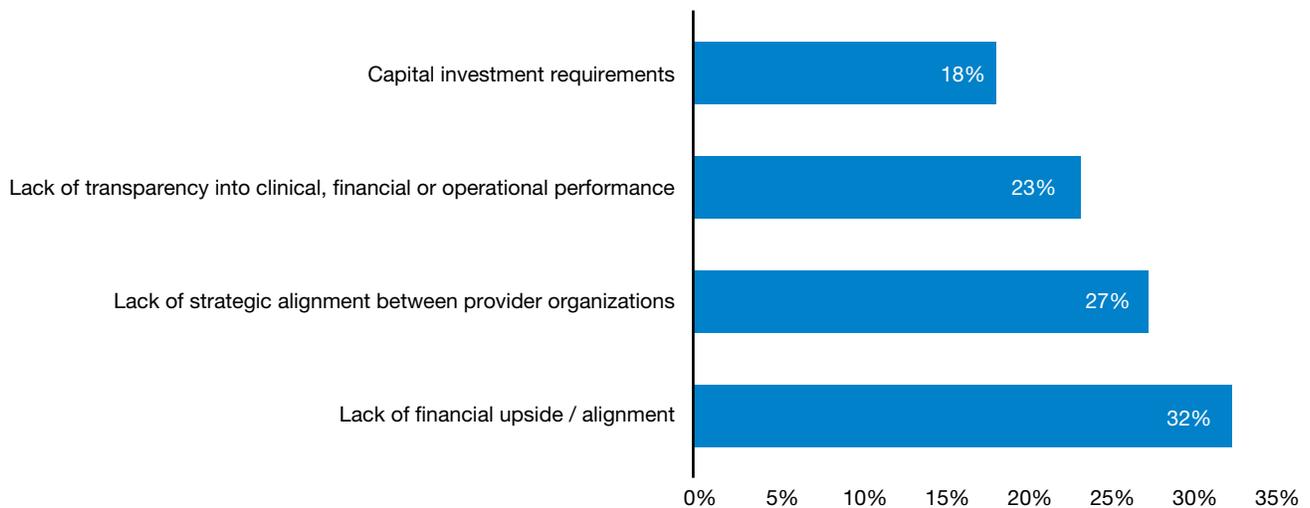
FIGURE 31 | POPULATION HEALTH METRICS

FEE FOR SERVICE	AT RISK, VALUE-BASED ECOSYSTEM
Average Daily Census	Days per 1,000
Length of Stay	Admissions per 1,000
Per Visit Contribution Margin	Visits per 1,000
Adjusted Patient Days	Hospitalization/ED Avoidance
Service Line Development	Shift to Outpatient, Community, Home
Increase Utilization	Reduce Utilization
Hospitalizations	Reduction in Ambulatory Care Sensitive Hospitalizations
Cost Per Procedure	Average Annual Cost of Care for Patients with Diabetes
Margin per Service or Procedure	Margin per Covered or Attributed Life
Admissions and Readmissions	Preventable Admissions and Readmissions

Population health management requires the use of value-oriented metrics. These measures are diametrically opposite to those oriented towards “filling beds” and increasing resource utilization. Metrics need to be risk adjusted to better reflect the age, sex, race, ethnicity and health of a local population. In addition, benchmarks must be carefully selected as process inefficiencies may already be embedded in the reported metrics of local markets, as evidenced by the ACO cost-savings results.⁶⁹

A successful population health management initiative requires strong leadership, strategic alignment, a tolerance for financial risk, a data-driven culture supported by the appropriate infrastructure and process redesign — a challenge for any organization, given local market dynamics and the preponderance of fee-for-service reimbursement.

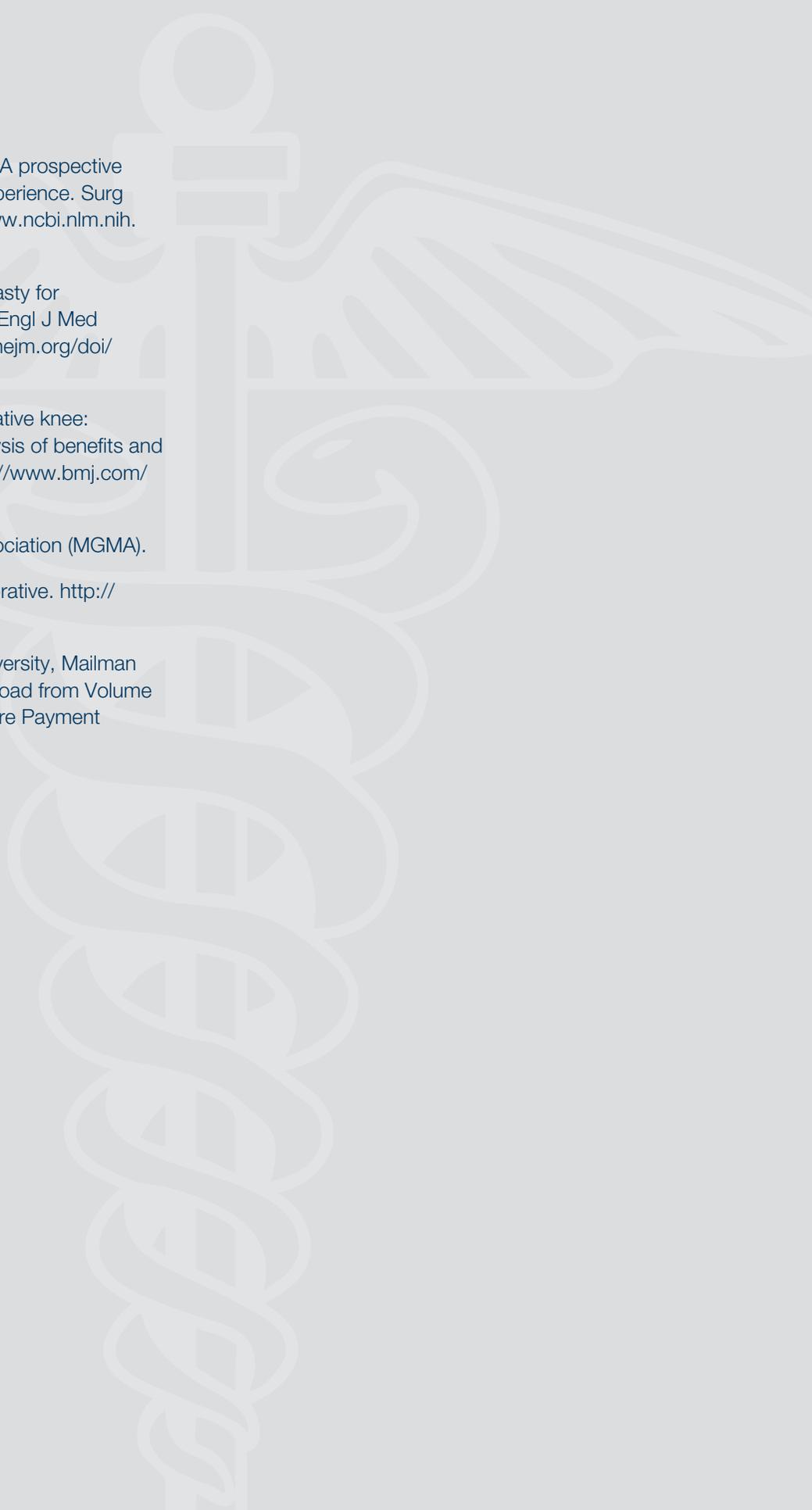
FIGURE 32 | BARRIERS TO POPULATION HEALTH MANAGEMENT IMPLEMENTATION



Source: Athenahealth population health roundtable, May 2017

ENDNOTES

46. What is Population Health?. April 27, 2015. <https://mha.gwu.edu/what-is-population-health/>.
47. Milliman Research Report. Chronic conditions and comorbid psychological disorders; July 2008 file:///C:/Users/dgruber/Downloads/chronic-conditions-and-comorbid-RR07-01-08%20(1).pdf
48. WebMD. Dealing with chronic illness and depression. <http://www.webmd.com/depression/guide/chronic-illnesses-depression>.
49. Polin I. Medical Crises Counseling: Short-term Therapy for Long-term Illness. New York: WW Norton, 1995
50. MACStats: Medicaid and CHIP Data Book. December 2016. https://www.macpac.gov/wp-content/uploads/2016/12/MACStats_DataBook_Dec2016.pdf
51. Robert Wood Johnson-Bloomberg School of Public Health Chart Book, February 2010. Chronic Conditions: Making the Case for Ongoing Care. Data sourced from Medicare Standard Analytic File (SAF), 2007.
52. Spending in the Last Year of Life and the Impact of Hospice on Medicare Outlays: Analysis of a decade of Medicare data ending 2013, and assessment of the impact of hospice on Medicare costs. June 22, 2015. Table 1-1 <http://medpac.gov/documents/contractor-reports/spending-in-the-last-year-of-life-and-the-impact-of-hospice-on-medicare-outlays-rev.pdf>
53. Quintiles IMS Institute. Medicines Use and Spending in the U.S; May 2017 <http://www.imshealth.com/en/thought-leadership/quintilesims-institute/reports/medicines-use-and-spending-in-the-us-review-of-2016-outlook-to-2021>.
54. PwC Health Research Institute: Behind the Numbers, 2015 and analysis of CVS Caremark data. <http://hitconsultant.net/2015/01/26/how-specialty-drugs-impact-healthcare-infographic/>
55. International Federation of Health Plans. 2012 Comparative Price Report: Variation in Medical and Hospital Prices by Country; April 2013
56. Center for Studying Health System Change. Wide variation in hospital and physician payment rates evidence of provider market power. Research brief #16, November 2010
57. Variation in Healthcare Spending: Target Decision Making, Not Geography (slide presentation); Institute of Medicine of the National Academies
58. Understanding of the Efficiency and Effectiveness of the Health Care System; The Dartmouth Atlas of Healthcare
59. MedPAC Data Book. Healthcare Spending and the Medicare Program, June 2015
60. Pain Foundation. <http://www.painfoundation.org/learn/publications/files/painfactsandstats.pdf>
61. CDC National Center for Health Statistics. <https://www.cdc.gov/nchs/data/hus/06.pdf>
62. National trends in the surgical treatment for lumbar degenerative disc disease: United States, 2000 to 2009. The Spine Journal February 2015; Volume 15, Issue 2, Pages 265–271. [http://www.thespinejournalonline.com/article/S1529-9430\(14\)01544-7/abstract](http://www.thespinejournalonline.com/article/S1529-9430(14)01544-7/abstract)
63. Systematic Review of Randomized Trials Comparing Lumbar Fusion Surgery to Nonoperative Care for Treatment of Chronic Back Pain. Spine April 2007; Volume 32 (7), 816-823. http://journals.lww.com/spinejournal/Abstract/2007/04010/Systematic_Review_of_Randomized_Trials_Comparing.18.aspx

- 
64. 64 “Unnecessary” spinal surgery: A prospective 1-year study of one surgeon’s experience. *Surg Neurol Int* 2011; 2: 83. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3130462/>
 65. A Randomized Trial of Vertebroplasty for Osteoporotic Spinal Fractures. *N Engl J Med* 2009; 361:569-579. <http://www.nejm.org/doi/full/10.1056/NEJMoa0900563>
 66. Arthroscopic surgery for degenerative knee: systematic review and meta-analysis of benefits and harms *BMJ* June 2015;350. <http://www.bmj.com/content/350/bmj.h2747>
 67. Medical Group Management Association (MGMA).
 68. Montefiore Hudson Valley Collaborative. <http://montefiorehvc.org/who-we-are/>
 69. Bartlett, Lawrence. Columbia University, Mailman School of Public Health. *On the Road from Volume to Value: Understanding Healthcare Payment Approaches*

AUTHOR'S BIOGRAPHY

David Gruber, MD, MBA, is a Managing Director and the Director of Research with Alvarez & Marsal's Healthcare Industry Group in New York, specializing in strategy, commercial due diligence, analytics, new ventures and health benefits. Dr. Gruber brings 32 years of diversified healthcare experience as a consultant, corporate executive, Wall Street analyst and physician.

Dr. Gruber's A&M publications include: Getting (Much) Closer to the Cost Precipice; Safety Net Hospitals at Risk: Re-thinking the Business Model; Behavioral Health: Key to Chronic Disease Costs; Healthcare: Economic Value Need Not Apply (Yet); and Post-Acute Care: Disruption (and Opportunities) Lurking Beneath the Surface.

Before joining A&M, he spent three years as the Founder of Healthcare Convergence Associates, a consulting firm focused on the convergence of healthcare, technology and the consumer. His initiatives included wireless and tele-health opportunities, chronic obstructive pulmonary disease (COPD) technology assessment, pharmacy benefit management (PBM) diabetes innovation, and retail health and wellness. He was also involved in three healthcare-related information technology (IT) start-ups.

Until 2008, Dr. Gruber was Vice President of Corporate Development and New Ventures with the Johnson & Johnson Consumer Group of Companies. His primary focus was in dermatology / aesthetics, consumer engagement and wireless health across the company. From 1995 to 2004, he worked on Wall Street as a top-ten rated medical supplies and devices analyst at Lehman Brothers, Piper Jaffray and Sanford Bernstein. He was the lead analyst for the initial public offering of Intuitive Surgical (robotics) and Given Imaging, and a merchant banking investment in Therasense.

Prior to entering Wall Street, Dr. Gruber was Vice President of Planning and Business Development for the \$1.6 billion healthcare group at Bristol-Myers that included Zimmer, ConvaTec, Linvatec and Xomed-Treace. While at Bristol-Myers, he represented the company with the Health Industry Manufacturing Association (HIMA) as it deliberated the merits of Hillary Clinton's healthcare reform proposals.

Dr. Gruber has recently appeared on NPR and C-Span; was quoted in the Washington Post, Los Angeles Times, The Deal, Healthcare Finance News, Managed Care Executive, Managed Care Outlook, Becker's Hospital Review and Inside Health Policy; and was published in the Journal of Diabetes Science & Technology, Turnaround Management Association Newsletter of Corporate Renewal and American Bankruptcy Institute Journal.

Dr. Gruber is a magna cum laude graduate of a six-year BS-MD program, having earned a bachelor's degree from the Sophie Davis School of Biomedical Education, CCNY in 1981 and a medical degree from the Mt. Sinai School of Medicine in 1983. He also has an MBA from Columbia University and was a Kellogg Foundation National Fellow. Dr. Gruber is currently a Senior Fellow, Healthcare Innovation and Technology Lab (HITLAB) at Columbia Presbyterian. He is a re-elected Trustee to the Teaneck Board of Education.



ABOUT ALVAREZ & MARSAL

Companies, investors and government entities around the world turn to Alvarez & Marsal (A&M) when conventional approaches are not enough to make change and achieve results. Privately held since its founding in 1983, A&M is a leading global professional services firm that provides advisory, business performance improvement and turnaround management services.

With over 3000 people across four continents, we deliver tangible results for corporates, boards, private equity firms, law firms and government agencies facing complex challenges. Our senior leaders, and their teams, help organizations transform operations, catapult growth and accelerate results through decisive action. Comprised of experienced operators, world-class consultants, former regulators and industry authorities, A&M leverages its restructuring heritage to turn change into a strategic business asset, manage risk and unlock value at every stage of growth.

Follow us on:



When action matters, find us at: www.alvarezandmarsal.com

ALVAREZ & MARSAL