Emergency Department Super Utilizer Programs

*Rural Health Systems Analysis and Technical Assistance Project*

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**Key Points**

- Five percent of patients account for nearly 25% of all Emergency Department visits in the United States.
- Super Utilizer programs identify Emergency Department super utilizers and facilitate health and human service care alternatives (e.g., primary care coordination and social service assistance).
- Super Utilizer programs generally improve participant health, reduce Emergency Department visits, and decrease hospital charges.

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SUMMARY

Five percent of patients account for nearly 25% of all emergency department (ED) visits in the United States. These “super utilizers” (SUs) of ED services often do not receive the right care, with the right provider, at the right time—or at the right price. Typical SU health concerns of chronic disease and low acuity tend to be inappropriately addressed in the ED, which is designed to care for acute, episodic, and emergent health conditions. Super utilizer programs identify SUs and facilitate alternative care models (e.g., primary care coordination and social service assistance) that promote better SU health and facilitate appropriate health care service use. Super utilizer programs generally improve participant health, reduce ED visits, and decrease hospital charges. Hospital operated SU programs are generally not profitable without grant support or case management revenue. To optimize the financial benefit of SU programs, payers, hospitals, and other providers should develop shared savings agreements. This paper describes SU program design, implementation, operation, and assessment, and three currently operating SU programs (case studies).
EMERGENCY DEPARTMENT SUPER UTILIZERS

A small percentage of patients utilize a disproportionate share of health care services. In 2008, 1% of patients accounted for 22% of total health care spending in the United States.\(^1\) Emergency department utilization reflects similar health care spending proportions. Five percent of patients accounted for nearly 25% of all Emergency Department (ED) visits.\(^2\) Although similar data are not available for rural EDs, disproportionate utilization of an annual eight million rural ED visits in 2008\(^3\) by a small percentage of individuals is likely. Implementation of the Patient Protection and Affordable Care Act of 2010 should increase the number of insured in both private and public health insurance plans. It is unclear if pent-up demand for health care services will increase primary care visits or if the newly insured will primarily include healthy people. However, if demand from the newly insured overwhelms primary care capacity, or if patients do not establish a medical home with a primary care provider, ED visits could increase. Thus, there is growing interest in managing inappropriate ED use.

A patient who disproportionately utilizes ED services is considered a “super utilizer” (SU). Although there is no standard definition of an SU, a Centers for Medicare and Medicaid Services bulletin defined SUs as “patients who accumulate large numbers of emergency department visits and hospital admissions which might have been prevented by relatively inexpensive early interventions and primary care.”\(^4\) In one study that defined SUs as patients using the ED three or more times per year, 5%-8% of ED patients accounted for 21%-28% of visits, over 50% of ED patients sought care at two or more EDs, and 70% of visits were on evening or night shifts.\(^5\) Super utilizers also utilize other health care services with associated costs during ED visits, including laboratory, pharmacy, and radiology services.

The SU patient is more likely to be female, Caucasian, between the ages of 25-44, and poor.\(^2,5\) The SU patient is more likely to present to an ED with lower acuity complaints during the evening, yet believe they require immediate medical attention.\(^2,6\) Most SUs are insured, and they are more likely to be insured through Medicaid than by private insurance.\(^7\)

Most SUs have at least one psychiatric diagnosis and one or more chronic illnesses.\(^5,8\) Super utilizers also experience significant barriers to accessing routine health care, including homelessness, substance abuse, severe chronic illnesses, physical disability, dental disease, early life trauma, and mental health problems.\(^9-11\) Due to mental health issues and chemical dependency, many SUs have difficulty navigating the health care system and keeping scheduled health care provider appointments. Additionally, SUs may have had negative experiences with providers during prior encounters.\(^5\) Thus, SUs tend to continue to visit the ED frequently over time and many continue to generate high costs year after year. Nearly 60% of Medicaid beneficiaries who were among the most expensive 10% in one year remained among the top 10% in two subsequent years.\(^12\) Other factors that might increase the risk of excessive ED utilization include no recognized source of primary care, multiple chronic diseases, inadequate housing, no transportation options, poor health self-rating, minimal social support, irregular employment, residence proximate to an ED, and absent trust in the health care system.
SUPER UTILIZER PROGRAMS

Super utilizers present to the ED primarily with low acuity and chronic disease concerns. Behavioral health issues, substance abuse, and social isolation factors often complicate the clinical situation. The SU clinical and social profile therefore suggests the need for robust primary care, care coordination, social services, and health advocacy. In contrast, ED care is designed to treat acute, episodic, and emergent clinical situations. Therefore, ED care inadequately meets SU care needs. Many have called for health care to be at the right place, with the right provider, and at the right time. The ED is generally the wrong place and the wrong provider for typical SU health care concerns. Care should also be at the right price. Repeated ED care is likely to be more expensive than care coordinated with the primary care office and in the community.

To address inadequate/inappropriate patient care, and to reduce health care costs, SU programs have been implemented to provide patient-centered interventions to improve overall health, bolster care coordination, reduce overutilization, and decrease health care spending through directed care management of high-cost and high-need patients who disproportionately use health care services. Hospitals generally establish SU programs, although other organizations (e.g., payers or social service agencies) can also do so. Regardless of organizing entity, SU programs have the potential to impact hospital ED utilization and financing. Thus, hospitals should be involved in SU program design and assessment.

This paper describes SU program design, implementation, operation, and assessment, as well as three currently operating SU programs (case studies). In brief, the SU program steps that will be described are:

1. Establish SU program goals.
   Program goals may be as straightforward as reducing ED utilization or as complex as reducing hospital costs associated with SUs.

2. Define data required to assess the SU program.
   Availability of various data will be required to identify SUs and evaluate the SU program.

3. Identify data sources and data analysis capacity.
   Once data needs are defined, the SU program must locate required data and ensure capacity to access data in a useable format and analyze it.

4. Define an SU.
   The SU program must define an SU (e.g., by number of ED visits per year) in order to identify SUs among all ED patients.

5. Develop an SU program business plan.
   New program development should include a financial pro forma as part of a business plan to project program costs and savings.

6. Establish a multidisciplinary care team.
   Since the reasons for inappropriate ED use are multiple, multiple skills sets are necessary for effective intervention.

7. Collaborate with community resources.
   SU program services should not be duplicative of already established community-based services and competencies.
8. *Design alternative care models and intervention plans.*
   Interventions should flexibly meet the health and human services needs of SUs.

9. *Start with a small number of SUs.*
   A limited initial caseload allows SU program team building and care process improvement.

10. *Assess SU program outcomes.*
    Objective program goals serve as program performance metrics.

**SUPER UTILIZER PROGRAM DESIGN**

SU program design begins with outlining program goals. Explicit program goals will define program data requirements and the program evaluation process. Program goals (and associated indicators in parentheses) may include:

- Decreased ED visits (ED visits per SU)
- Decreased payer costs (hospital revenue received from payer)
- Increased primary care visits (primary care visits per SU)
- Decreased hospital inpatient admissions (hospital inpatient admissions per SU)
- Decreased hospital charges (hospital ED and associated ancillary charges)
- Decreased uncompensated care charges (charge-to-revenue ratio)
- Decreased hospital costs (allocated hospital costs)*
- Increased hospital revenue (e.g., grant funds, care management fees, and other revenue sources)
- Increased patient satisfaction and/or self-perception of health (patient surveys)
- Improved chronic disease status (chronic disease management metrics)
- Decreased admissions for ambulatory care sensitive conditions (ACSCs) (ACSC admissions per SU)15

Data sources utilized by the SU program will depend on the program’s SU definition and the data selected for program evaluation. Typical SU program data sources include:

- ED Log – The ED log is a record of basic ED visit data: date, time, provider, presenting complaint, and discharge disposition. The ED log generally does not include financial data.
- Claims Data – Claims data include detailed information required for billing payers: insurance carrier, procedure codes, diagnosis codes, hospital charges. Claims data do not include information for self-pay patient visits and do not include hospital revenue data.

* A discussion of hospital cost allocation is beyond the scope of this paper. Determining hospital cost for a service line (ED), or a unique service like an ED visit and associated ancillary services, is difficult. However, the incremental (variable) hospital cost for one ED visit is relatively low. Therefore, while payer cost savings from an SU program may be significant, hospital cost savings may be minimal. As hospitals and payers increasingly enter shared savings payment agreements, determining which organization saves costs becomes more complex.
• Electronic Health Record (EHR) – A well-developed EHR will contain complete clinical care data and may be linked to the hospital billing system. If the hospital is affiliated with area clinics, longitudinal data that includes multiple visit sites and dates may be available. Most EHRs contain a database function that allows identification of patients or visits based on predetermined parameters such as those that identify an SU. Not all hospitals and clinics utilize a fully functional EHR.

• Cost-accounting System – Hospital cost-accounting systems are generally incapable of allocating fixed and variable costs to a unique ED visit or associated ancillary services. However, to assess potential hospital costs saved by reduced SU utilization of the ED, service cost assumptions are necessary.

• Health Information Exchange (HIE) – An HIE (not to be confused with a Health Insurance Exchange) is an electronic connectivity system based at a regional or state level. An HIE is designed to increase connectivity and enable patient-centric information flow to improve the quality and efficiency of care. An HIE should allow data sharing between hospitals and other health care providers.

• Proprietary Systems – One example of a proprietary SU data management system is Collective Medical Technologies’ Emergency Department Information Exchange (EDIE), a web-based application that enables care providers to identify SUs. Emergency Department visit information is sent to EDIE through a Health Level Seven International (HL7) feed from the hospital. If the patient has care coordination guidelines in the system, or has exhibited a pattern of over-utilization, a notification is automatically relayed to the facility and other interested parties, such as the primary care provider or case manager.

Once SU program goals are established and data sources identified, organizers should develop a program business plan, or at a minimum, a financial pro forma. Business plan details will not be discussed here, but SU organizers should make caseload assumptions, estimate program revenue (e.g., grants and reduced hospital costs), and estimate program costs (e.g., data collection/analysis/presentation, intervention team compensation, and hospital revenue loss). During SU program design and implementation, organizers should consider community resources (not hospital- or health system-based) that may already be in place that can coordinate care and assist patients to receive appropriate care. Program organizers also might consider engaging current hospital resources, such as care management programs to reduce hospital readmissions, to help reduce inappropriate ED utilization.

To evaluate program performance, SU program organizers must first establish program goal(s), define data requirements, and identify data sources. Baseline data are necessary to compare pre/post implementation performance. The data required will depend on program goals. For example, if the sole program goal is to reduce ED visits for patients identified as SUs, then the only data required are ED visit rates for those patients before and after program implementation. If program goals include a detailed financial impact analysis, a much more robust data set is required, including hospital ED charges, ED revenue, ED costs, and program costs. If program goals include health outcomes, ACSC admission rates, chronic disease management metrics, patient satisfaction surveys, and/or patient self-perception of health data are required.
Program goals and data availability may determine the parameters for SU definition. In general, SU programs identify SUs by the number of ED visits within a specified time period. Based on program goals and resources available for SU intervention, an SU program can define SUs narrowly or widely. A sample of SU criteria include:

- Emergency department visit rate (published SU program criteria range from more than two visits per year to five visits per month)\textsuperscript{2,5,6,18-22}
- A combination of ED and inpatient visits (e.g., six ED visits and two inpatient admissions per year)\textsuperscript{4,23}
- Patients who account for an upper percentage of all ED visits (e.g., the top 5% of ED utilizers)\textsuperscript{4,5,11}
- The top 10 ED utilizers\textsuperscript{24}
- Patients who ED personnel have identified as SUs\textsuperscript{5}

**SUPER UTILIZER INTERVENTION**

Super Utilizer programs should not only identify SUs based on utilization data, but also develop program inclusion criteria for those patients most likely to benefit from an alternative care model. Patients with complex health care needs, multiple chronic conditions, inappropriate resource use, and high ED/inpatient utilization are typically best suited for intervention. Alternative care models, or SU interventions, are generally designed by a multidisciplinary team that can vary from a few individuals meeting frequently to larger groups that meet less often. Team members may include physicians, nurses, pharmacists, social workers, behavioral health specialists, health coaches, care managers, community health workers, and others. The SU program team reviews utilization patterns (not necessarily limited to a single hospital) and available medical records to evaluate possible etiologies for super utilization, including barriers to appropriate health care access.

Super Utilizer programs utilize a variety of approaches to reduce ED utilization, including case management, individualized care plans, patient education, primary care partnerships, health coaching, and managed care level interventions.\textsuperscript{19} Super Utilizer programs customize interventions based on individual patient needs. For example, an SU visiting multiple providers may benefit from care coordination. An SU inappropriately using an ambulance for transport to the ED may benefit from community transportation options. An SU actively abusing substances may benefit from rehabilitation program participation or primary care medication contracts.

Super Utilizer program operations and interventions will vary by program, team composition, and available resources. However, a typical SU program will include the following activities:

- **Initial Contact** – A potential SU program participant is contacted by a program team member, preferably while the patient is in the ED. Contact can also occur at the patient’s home or primary care office. If the patient does not agree to participate in the SU program, the patient is provided team contact information and is invited again to participate during every subsequent ED visit. If the patient agrees to participate in the SU program, the team assesses patient needs and develops a multidisciplinary intervention care plan.

- **Case Management** – The most frequently cited and studied SU intervention in the literature is case management. The Case Management Society of America defines case management as “a
The multidisciplinary program presents an option for intervention, goal setting and planning, health education, self-management coaching, and linkage to community resources.6

- Team Outreach – Following initial ED contact, team outreach occurs in the patient’s home within two to three days. Home visit activities include a description of the SU program and its goals, and an introduction to the case manager and other team members. Through client interview, the case manager identifies barriers to accessing appropriate care (e.g., lack of transportation or substance abuse) and answers patient questions. Team members may need to meet with a client multiple times in person in the patient’s home or community setting to build trust and establish a relationship that facilitates intervention plan compliance. Small incentives such as grocery certificates and phone cards help encourage SU visits to keep appointments.27 If a participating patient presents to an ED, they are flagged in the hospital’s EHR as an SU program patient to allow timely intervention. Ongoing activities include regular patient contact by phone or in person, patient education, and immediate follow-up if the client presents to an ED.

Many SU programs begin with only a few patients as they refine intervention plans and other program elements. Some programs have started with as few as 12 patients in the first year. An initially small patient cohort helps the multidisciplinary team become more cohesive, understand which interventions work (and which do not), and improve program design to increase the likelihood of success. Over time, SU programs have found the ideal case manager-to-patient ratio to be between 1:25 and 1:50.10,24

The reasons for inappropriate ED utilization are multiple. Therefore, SU programs must offer a broad range of services to address varying health care and human service needs. If an SU program multidisciplinary team is unable to provide necessary services, care is coordinated with community-based services. Super Utilizer programs develop partnerships with local health care providers, social service organizations, and community workers.18 Potential partners for care coordination include:

- Mental health centers
- Urgent care clinics
- Primary care clinics
- Free medical clinics
- Homeless shelters
- Faith-based organizations
- Area Agencies on Aging
- Public health departments
- Community health workers
- Community paramedics
- Other care coordination programs
SUPER UTILIZER PROGRAM EVALUATION

Pre-determined SU program goals are a prerequisite for program evaluation. For example, if the program goal is to reduce ED utilization for a defined cohort of patients (the SUs), performance will be measured as SU utilization of the ED before/after program implementation and trended over time. Baseline ED utilization (e.g., number of ED visits and/or ED charges) by the SU cohort is generally measured for the 12-month period prior to program initiation. Emergency department utilization is then measured periodically to identify change from pre-program utilization and to quantify utilization trends. Analysis is more robust with comparisons to a control cohort not participating in the SU program. However, evaluators should be cautious about selection bias; patients who agree to SU program participation may be more likely to respond to care alternatives than those who do not agree to participate.

Utilization data analysis and financial analysis are fundamental to SU program evaluation. Some hospitals employ hospital health information technology staff to provide data analyses. Other SU programs have purchased data analysis and visualization software. Data are typically presented in simplified cost and utilization reports that include the total number of ED visits and aggregate hospital charges for each patient. Other reports include monthly patient status updates for case manager and/or care coordination team review.

In addition to quantitative SU program evaluation, frequent SU program infrastructure and care management review is also important. Queries such as “Is the multidisciplinary team composition correct?” “Have we engaged all appropriate community resources?” and “Is our inter-professional communication strategy effective?” should be considered. Common process improvement strategies (e.g., lean production and Plan-Do-Study-Act) can be applied to SU programs just as to other hospital service lines.

Profitability analysis of an SU program is potentially complex. Revenue may include grants, care management fees, and ED costs savings, but expenses may include SU team compensation costs, data analysis costs, and reduced insurance payments. Therefore, SU program financial analysis will likely require assistance from the hospital CFO or comptroller for access to, and analysis of, claims data, Provider Statistical and Reimbursement system reports, and cost allocation methodologies. Without a shared savings agreement with a payer, or external funding for care management, an SU program is unlikely to increase hospital profits. Yet some SU programs persist as mission-driven community services and as opportunities for hospital participation/experience in care management.

SUPER UTILIZER PROGRAM RESULTS

Super Utilizer program results vary due to differing SU program inclusion criteria, interventions, locations, assets, staffing, and number of SUs enrolled. Super Utilizer programs have reported decreases in SU visits to the ED from 31% to 83%. Although SU use of the ED typically decreases over time, SUs with higher levels of prior ED use may continue to access the ED more often than those with lower levels of prior ED use. Two SU programs reported no reductions in ED use among enrolled SUs. In addition to generally lower SU utilization of the ED, several programs reported both clinical and social improvements, including reduced inpatient admissions, reduced drug and alcohol use, increased housing stability, and increased Medicaid enrollment.
ED charges for SUs have been reported to decrease from 26% to 45%. Inpatient charges for SUs also reportedly decreased from 65% to 67%. Super Utilizer programs tend to reduce payer costs because hospital charge reductions are typically greater than SU program costs. Shumway et al. reported for each case management dollar invested in the SU program, hospital charges were reduced $1.44. Similar savings have been found in other programs. However, these program evaluations did not consider additional outpatient SU care costs. In summary, SU programs likely reduce payer costs, although not all additional outpatient costs have been considered. Conversely, SU programs likely reduce hospital revenue derived from ED service payments. To optimize the financial benefit of SU programs, payers, hospitals, and other providers should develop shared savings agreements.
CASE STUDIES

Emergency Department Consistent Care Plan
St. Luke’s Hospital
Cedar Rapids, Iowa
Program Setting: Urban hospital located in eastern Iowa

The St. Luke’s Hospital ED is the second busiest ED in the state of Iowa, with over 55,000 visits annually. After four years of planning, the Emergency Department Consistent Care Plan (EDCCP) began on January 1, 2012. The criterion for EDCCP patient enrollment is 12 or more ED visits in the prior 12 months. Potential patients for EDCCP enrollment are identified via monthly reports from the hospital’s Performance Improvement Department. Patients enrolled in the EDCCP are 62% female, 87% Caucasian, and > 50% insured through Medicaid.

After patient identification for the EDCCP, the social worker and ED physician assign an initial patient care plan. Care plan alternatives include chest pain, abdominal pain, behavioral health, general pain, back pain, headache, and advanced age. Appropriate care plans are mailed to the patient with a letter of introduction. An initial intervention occurs when the patient calls after receiving the introduction letter or during an ED visit. The initial intervention includes explanation of the program, description of the case manager’s role, and an opportunity for the patient to ask questions about the EDCCP. Patients enrolled in the EDCCP are asked to sign a release of information to allow better care coordination among community providers. Patients are flagged in the hospital’s electronic health record as EDCCP participants. If an EDCCP patient presents to the ED, the social worker sees the patient in the ED or contacts the patient by telephone as soon as possible. During follow-up telephone calls, the social worker reviews discharge instructions, determines if the patient has followed recommended instructions, and discusses additional patient needs. Other EDCCP interventions include scheduling appointments, reminding patients about appointments, assisting with transportation, exploring health insurance options, and discussing the patient’s role and responsibilities in self-care. Presently, patients remain in the EDCCP indefinitely. Patient intervention recurs if patient utilization of the ED increases.

During 2012, the EDCCP social worker made 575 patient contacts. Emergency department visits were reduced by 1,142 visits (1,679 to 537) and ED charges were reduced by $1,113,728 ($1,694,062 to $580,334). The EDCCP is considered successful due to a reduction in ED visits and the provision of care in more appropriate settings.
Humboldt County Super Utilizer Program
St. Joseph Hospital and Humboldt Del Norte Independent Practice Association
Humboldt County, California
Program Setting: Large rural hospital located in northern California

The Humboldt Super Utilizer model combines the expertise of established community-based care coordination programs; the Care Transitions Program (CTP) at St. Joseph Hospital in Eureka, California; and the Priority Care Program (PCP) at the Humboldt Del Norte Independent Practice Association. St. Joseph Hospital had nearly 38,000 ED visits last year. Registered Nurse (RN) care managers from the CTP and PCP review hospital claims data to identify patients who received two or more ED visits per month in a six-month period. The team then reviews the medical records to determine if additional risk factors for overutilization are present, such as complex health care needs, frequent hospitalizations, and history of mental health diagnoses.

Once patients are identified for the program, the RN care coordinator contacts the patient during an ED visit or inpatient admission. If the RN care coordinator is unable to contact the patient in the hospital, the initial contact occurs in the patient’s primary care office. Once the RN care coordinator meets the patient, the RN becomes a member of the patient’s health care team. The first home visit and initial assessment occurs within two to three days of the initial ED visit, primary care office visit, or hospital discharge. The initial assessment evaluates medical status/health trajectory, social support, medical neighborhood, mental health issues, and self-management. The RN care coordinator accompanies the patient to primary care provider and specialist appointments to develop patient-centered goals and clinical treatment plans. The RN care coordinator performs medication reconciliation and ensures that the patient has appropriate primary care physician follow-up. A multidisciplinary team consisting of primary care providers, PCP and CTP nurse case managers, ED physicians, ED staff, and various other health care professionals provide care coordination. The team meets regularly to discuss enrolled patients and current systems of care. A subset of the team meets weekly to huddle regarding specific patient care concerns and updates. One or more team members typically meet with patients once a week during the first 30-90 days and then monthly to promote patient self-care. If a patient successfully transitions from episodic ED care to consistent primary care, the patient remains in the CTP for 30-90 days. If a patient has not met CTP goals within 90 days, the patient transitions to the PCP for long-term care coordination.

Twelve patients were enrolled in the Humboldt County Super Utilizer program in 2012. A low program census allowed the team to understand which interventions were effective, and which were not. The second year of the program began in July 2013, and the program expects to enroll approximately 30 patients.
Center for Integrative Medicine  
Spectrum Health  
Grand Rapids, Michigan  
Program Setting: Urban/rural health system located in western Michigan

Spectrum Health is a not-for-profit health system based in western Michigan and includes 10 hospitals, 170 ambulatory service sites, and two physician groups totaling 960 providers. The Spectrum Health Center for Integrative Medicine (CIM) is a multispecialty clinic that provides comprehensive care for 450 ED SUs. The CIM collaborates with Network180, a distinct organization that provides behavioral and addiction assessments and treatment plans. The CIM targets patients with behavioral health concerns who have accessed at least 10 ED visits, or three or more inpatient admissions, within the past year. Patients with more than 20 ED visits are automatically contacted for CIM enrollment.

The CIM assumes care from the primary care providers and specialists, providing all patient enrollee medical and behavioral health care on-site, writing all prescriptions, and ordering all tests. CIM patients receive an initial comprehensive bio-psychosocial evaluation (including a full history and physical by a physician), mental health evaluation, addiction screening and planning, and social work management and intervention. Based on the comprehensive interdisciplinary team (emergency medicine physician, physician assistant, nurse care manager, and social worker) evaluation, the team develops a personalized care plan for each client. Patients typically exit the program after six to nine months. At program exit, the team provides the patient’s primary care provider a client condition summary and a detailed care manual to facilitate ongoing care. Staff members remain in contact with each patient and continuously support the patient’s provider to ensure that patient health improvements continue.

The CIM collaborated with Priority Health, a Michigan-based health care insurer, to develop an episode of care payment model that sustains the CIM program. The CIM also receives a single payment for each Medicaid managed care patient that covers all CIM services for the six-to-nine-month intervention. The CIM can care for up to 450 patients per year. The total CIM cost is $850,000 per year. After considering all revenues and costs, the Spectrum Health CIM program last year realized a $90,000 financial loss. However, the CIM program resulted in a one-year $3.2 million reduction in hospital charges. Priority Health saved nearly $500,000 for its members who participated in the program in the first year. For patients with more than 20 ED visits per year, the CIM reduced ED visits 65%. For patients with 10–19 visits per year, the CIM reduced ED visits 80%.
REFERENCES


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