**For Patients**

* **Access to care** – long wait times, limited availability of specialists, geographic barriers
* **Cost & affordability** – high insurance premiums, out-of-pocket expenses, surprise medical bills
* **Care coordination** – fragmented care across multiple providers, poor communication
* **Transparency** – unclear pricing, difficulty understanding insurance coverage
* **Patient experience** – rushed consultations, lack of personalized care, long hold times for appointments or billing
* **Digital literacy** – difficulty using patient portals, telehealth platforms, or health apps
* **Trust & communication** – lack of empathy, cultural/language barriers

**For Providers (Doctors, Nurses, Care Teams)**

* **Administrative burden** – excessive documentation, billing, and compliance tasks
* **Burnout** – staffing shortages, long hours, emotional strain
* **Technology challenges** – EHR usability issues, lack of interoperability, alert fatigue
* **Reimbursement pressure** – complexity of insurance coding, denied claims, value-based payment models
* **Care delivery gaps** – insufficient time per patient, difficulty tracking chronic care
* **Training & upskilling** – keeping up with new treatments, tools, and compliance rules

**For Health Systems & Hospitals**

* **Financial strain** – shrinking reimbursements, rising operational costs
* **Workforce shortages** – difficulty recruiting and retaining skilled staff
* **Data fragmentation** – siloed systems, lack of interoperability across EHRs and external providers
* **Quality & outcomes reporting** – regulatory burden, metrics overload
* **Patient engagement** – challenges in improving adherence and satisfaction
* **Cybersecurity risks** – rising data breaches and HIPAA compliance concerns
* **Operational inefficiencies** – bed shortages, bottlenecks in scheduling, discharge delays

**For Payers (Insurance Companies, Health Plans)**

* **Fraud, waste, and abuse** – difficulty detecting and preventing unnecessary claims
* **Member satisfaction** – complaints about denials, coverage confusion, limited provider networks
* **Regulatory compliance** – evolving federal and state requirements
* **Data integration** – difficulty combining clinical, claims, and pharmacy data
* **Cost containment** – managing high-cost chronic conditions and specialty drugs

**For Policy & Public Health**

* **Health equity** – disparities in access, outcomes, and social determinants of health
* **Chronic disease burden** – diabetes, heart disease, obesity, and mental health crises
* **Aging population** – increased demand on Medicare, long-term care, and home health
* **Pandemic preparedness** – gaps in coordination, supply chains, and vaccination infrastructure
* **Opioid crisis & behavioral health** – ongoing challenges with addiction and access to mental health services  
    
    
   **Relationship**

**Key Relationships:**

**Star Schema Design:**

* **3 Dimension Tables** (DimPatient, DimProvider, DimDate)
* **9 Fact Tables** (all the transactional data)

**Relationship Types:**

**DimPatient** (Center Hub) connects to ALL fact tables:

* One patient can have many appointments, bills, referrals, etc.

**DimProvider** connects to:

* FactAppointments (providers schedule appointments)
* FactReferrals (providers refer TO and FROM each other)
* FactInterpreter (providers use interpreter services)

**DimDate** connects to ALL fact tables:

* Every transaction has a date dimension for time-based analysis

**Special Relationships:**

1. **FactReferrals** has TWO relationships with DimProvider:
   * FromProviderID (referring provider)
   * ToProviderID (receiving provider)
2. **All Fact Tables** are connected through:
   * PatientID (links to patient demographics)
   * Date fields (links to time dimension)

**Power BI Implementation:**

When you import these tables into Power BI, create these relationships:

1. **One-to-Many** from DimPatient[PatientID] to all Fact tables
2. **One-to-Many** from DimProvider[ProviderID] to relevant Fact tables
3. **One-to-Many** from DimDate[Date] to all date fields in Fact tables
4. Set **cross-filter direction to "Both"** for interactive filtering

// PATIENT EXPERIENCE DASHBOARD - POWER BI

// This code provides DAX measures and data model structure for the dashboard

// ============================================================================

// DATA MODEL STRUCTURE

// ============================================================================

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Required Tables:

1. DimPatient (PatientID, Age, Gender, Race, Region, InsuranceType, PortalRegistered)

2. DimProvider (ProviderID, Specialty, Region, Facility)

3. DimDate (Date, Month, Quarter, Year)

4. FactAppointments (AppointmentID, PatientID, ProviderID, DateRequested, DateScheduled,

DateCompleted, WaitTimeDays, Status, CancelReason)

5. FactBilling (BillID, PatientID, DateOfService, TotalCharge, InsurancePaid,

PatientOOP, Denied, Appealed)

6. FactReferrals (ReferralID, PatientID, FromProviderID, ToProviderID, ReferralDate,

AppointmentDate, Status)

7. FactReadmissions (ReadmissionID, PatientID, DischargeDate, ReadmissionDate, DaysBetween)

8. FactSurveys (SurveyID, PatientID, Date, HCAHPSScore, TrustScore, CommunicationScore,

WaitTimeRating, CostClarityScore)

9. FactPortalUsage (LogID, PatientID, Date, LoginCount, FeatureUsed)

10. FactComplaints (ComplaintID, PatientID, Date, Category, Resolved)

11. FactTelehealth (SessionID, PatientID, Date, Completed, DropoffReason, TechIssue)

12. FactInterpreter (ServiceID, PatientID, ProviderID, Date, Language)

\*/

// ============================================================================

// 1. ACCESS TO CARE MEASURES

// ============================================================================

Average Wait Time (Days) =

AVERAGE(FactAppointments[WaitTimeDays])

Wait Time by Specialty =

CALCULATE(

[Average Wait Time (Days)],

ALLEXCEPT(DimProvider, DimProvider[Specialty])

)

Provider to Patient Ratio =

DIVIDE(

DISTINCTCOUNT(DimPatient[PatientID]),

DISTINCTCOUNT(DimProvider[ProviderID]),

0

)

Appointment Completion Rate =

DIVIDE(

COUNTROWS(FILTER(FactAppointments, FactAppointments[Status] = "Completed")),

COUNTROWS(FactAppointments),

0

)

Cancellation Rate =

DIVIDE(

COUNTROWS(FILTER(FactAppointments, FactAppointments[Status] = "Cancelled")),

COUNTROWS(FactAppointments),

0

)

// ============================================================================

// 2. COST & AFFORDABILITY MEASURES

// ============================================================================

Average Out-of-Pocket Cost =

AVERAGE(FactBilling[PatientOOP])

OOP by Demographics =

CALCULATE(

[Average Out-of-Pocket Cost],

ALLEXCEPT(DimPatient, DimPatient[Age], DimPatient[InsuranceType])

)

Insurance Denial Rate =

DIVIDE(

COUNTROWS(FILTER(FactBilling, FactBilling[Denied] = TRUE)),

COUNTROWS(FactBilling),

0

)

Appeal Success Rate =

DIVIDE(

COUNTROWS(FILTER(FactBilling, FactBilling[Appealed] = TRUE && FactBilling[Denied] = FALSE)),

COUNTROWS(FILTER(FactBilling, FactBilling[Appealed] = TRUE)),

0

)

Insurance Coverage Ratio =

DIVIDE(

SUM(FactBilling[InsurancePaid]),

SUM(FactBilling[TotalCharge]),

0

)

High Cost Patient Flag =

IF([Average Out-of-Pocket Cost] > 5000, "High Cost", "Standard")

// ============================================================================

// 3. CARE COORDINATION MEASURES

// ============================================================================

30-Day Readmission Rate =

DIVIDE(

COUNTROWS(FILTER(FactReadmissions, FactReadmissions[DaysBetween] <= 30)),

DISTINCTCOUNT(FactReadmissions[PatientID]),

0

)

90-Day Readmission Rate =

DIVIDE(

COUNTROWS(FILTER(FactReadmissions, FactReadmissions[DaysBetween] <= 90)),

DISTINCTCOUNT(FactReadmissions[PatientID]),

0

)

Incomplete Referral Rate =

DIVIDE(

COUNTROWS(FILTER(FactReferrals, FactReferrals[Status] = "Incomplete")),

COUNTROWS(FactReferrals),

0

)

Referral to Appointment Days =

AVERAGE(FactReferrals[ReferralDate] - FactReferrals[AppointmentDate])

Follow-up Completion Rate =

CALCULATE(

DIVIDE(

COUNTROWS(FILTER(FactAppointments, FactAppointments[Status] = "Completed")),

COUNTROWS(FactAppointments),

0

),

FactAppointments[AppointmentType] = "Follow-up"

)

// ============================================================================

// 4. TRANSPARENCY MEASURES

// ============================================================================

Price Variance Coefficient =

VAR AvgPrice = AVERAGE(FactBilling[TotalCharge])

VAR StdDev = STDEV.P(FactBilling[TotalCharge])

RETURN DIVIDE(StdDev, AvgPrice, 0)

Unclear Bill Rate =

DIVIDE(

COUNTROWS(FILTER(FactComplaints, FactComplaints[Category] = "Billing Confusion")),

COUNTROWS(FactBilling),

0

)

Cost Clarity Score =

AVERAGE(FactSurveys[CostClarityScore])

Price by Facility =

CALCULATE(

AVERAGE(FactBilling[TotalCharge]),

ALLEXCEPT(DimProvider, DimProvider[Facility])

)

// ============================================================================

// 5. PATIENT EXPERIENCE MEASURES

// ============================================================================

HCAHPS Score =

AVERAGE(FactSurveys[HCAHPSScore])

Patient Satisfaction Trend =

CALCULATE(

[HCAHPS Score],

DATESINPERIOD(DimDate[Date], LASTDATE(DimDate[Date]), -6, MONTH)

)

Call Abandonment Rate =

DIVIDE(

[Abandoned Calls],

[Total Calls],

0

)

Wait Room vs Provider Time Ratio =

DIVIDE(

AVERAGE(FactAppointments[WaitRoomMinutes]),

AVERAGE(FactAppointments[ProviderTimeMinutes]),

0

)

Top Complaint Categories =

TOPN(

5,

SUMMARIZE(

FactComplaints,

FactComplaints[Category],

"Count", COUNTROWS(FactComplaints)

),

[Count],

DESC

)

// ============================================================================

// 6. DIGITAL LITERACY MEASURES

// ============================================================================

Portal Adoption Rate =

DIVIDE(

COUNTROWS(FILTER(DimPatient, DimPatient[PortalRegistered] = TRUE)),

COUNTROWS(DimPatient),

0

)

Portal Engagement Rate =

DIVIDE(

DISTINCTCOUNT(FactPortalUsage[PatientID]),

COUNTROWS(FILTER(DimPatient, DimPatient[PortalRegistered] = TRUE)),

0

)

Telehealth Dropout Rate =

DIVIDE(

COUNTROWS(FILTER(FactTelehealth, FactTelehealth[Completed] = FALSE)),

COUNTROWS(FactTelehealth),

0

)

Tech Support Needed Rate =

DIVIDE(

COUNTROWS(FILTER(FactTelehealth, FactTelehealth[TechIssue] = TRUE)),

COUNTROWS(FactTelehealth),

0

)

Digital Adoption by Age =

CALCULATE(

[Portal Adoption Rate],

ALLEXCEPT(DimPatient, DimPatient[Age])

)

// ============================================================================

// 7. TRUST & COMMUNICATION MEASURES

// ============================================================================

Patient Trust Score =

AVERAGE(FactSurveys[TrustScore])

Communication Score =

AVERAGE(FactSurveys[CommunicationScore])

Interpreter Service Rate =

DIVIDE(

DISTINCTCOUNT(FactInterpreter[ServiceID]),

COUNTROWS(FactAppointments),

0

)

Cultural Sensitivity Complaints =

COUNTROWS(

FILTER(

FactComplaints,

FactComplaints[Category] = "Cultural Insensitivity"

)

)

Provider Communication Rating =

CALCULATE(

[Communication Score],

ALLEXCEPT(DimProvider, DimProvider[ProviderID])

)

// ============================================================================

// DASHBOARD DESIGN RECOMMENDATIONS

// ============================================================================

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PAGE 1: EXECUTIVE OVERVIEW

- KPI Cards: HCAHPS Score, Average Wait Time, OOP Cost, Readmission Rate

- Trend Lines: Monthly satisfaction scores, access metrics

- Regional Heatmap: Color-coded by patient satisfaction

- Alert Table: Top 5 areas needing attention

PAGE 2: ACCESS & WAIT TIMES

- Bar Chart: Wait time by specialty

- Map Visual: Provider distribution vs patient demand

- Matrix: Appointment completion rate by region and specialty

- Line Chart: Monthly cancellation trends with reasons

PAGE 3: COST & BILLING TRANSPARENCY

- Distribution Chart: OOP costs by demographics

- Funnel Chart: Total charge → Insurance paid → Patient OOP

- Bar Chart: Denial rates by insurance type

- Scatter Plot: Cost variance by facility

PAGE 4: CARE COORDINATION

- Gauge: 30-day and 90-day readmission rates

- Sankey Diagram: Referral flow (complete vs incomplete)

- Timeline: Referral to appointment timeline

- Table: High-risk patients for readmission

PAGE 5: DIGITAL ADOPTION

- Donut Chart: Portal adoption by age group

- Line Chart: Monthly portal engagement trends

- Bar Chart: Telehealth dropout reasons

- Heatmap: Digital literacy by region and age

PAGE 6: PATIENT SATISFACTION & TRUST

- Waterfall Chart: Satisfaction score components

- Word Cloud: Complaint categories

- Bar Chart: Trust scores by provider specialty

- Table: Interpreter service usage by language

PAGE 7: DRILL-THROUGH DETAILS

- Patient-level details with all metrics

- Provider-level performance cards

- Time-based analysis filters

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// COLOR SCHEME & FORMATTING

// ============================================================================

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Recommended Color Palette:

- Primary: #0078D4 (Healthcare Blue)

- Success/Good: #107C10 (Green)

- Warning: #FFB900 (Amber)

- Alert/Poor: #D13438 (Red)

- Neutral: #8A8886 (Gray)

Conditional Formatting Rules:

- Wait Time: <7 days (Green), 7-14 days (Amber), >14 days (Red)

- Satisfaction: >85 (Green), 70-85 (Amber), <70 (Red)

- Readmission: <10% (Green), 10-15% (Amber), >15% (Red)

- Portal Adoption: >60% (Green), 40-60% (Amber), <40% (Red)

\*/

// ============================================================================

// SLICERS & FILTERS

// ============================================================================

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Global Filters (All Pages):

- Date Range (Month, Quarter, Year)

- Region

- Patient Demographics (Age, Gender, Insurance Type)

Page-Specific Filters:

- Access: Specialty, Provider, Facility

- Cost: Insurance Type, Procedure Type

- Care Coordination: Discharge Type, High-Risk Flag

- Digital: Age Group, Tech Proficiency

- Trust: Provider, Language Preference

\*/

**Click the ℹ icon** on any KPI card to see:

1. **📊 HCAHPS Score**
   * Formula: Average of 10 survey questions
   * Example: Shows breakdown of all survey components
   * Real calculation with actual numbers
2. **⏱️ Wait Time**
   * Formula: (Appointment Date - Request Date) averaged
   * Example: 5 patients with different wait times
   * Result: 12 days average
3. **💰 Out-of-Pocket Cost**
   * Formula: Total Charges - Insurance Paid
   * Example: 5 bills showing the calculation
   * Includes copays, deductibles, coinsurance
4. **🔄 30-Day Readmission**
   * Formula: (Readmissions within 30 days / Total Discharges) × 100
   * Example: 250 discharges, 15 unplanned readmissions
   * Result: 6.0%
5. **✅ Completion Rate**
   * Formula: (Completed / Total Scheduled) × 100
   * Example: 785 completed out of 1,000 scheduled
6. https://vishalkarur.github.io/ - Create like this....