

# Introduction to Power BI





# ธัญญ์ธนวัชร ปรากฏ์อมรกุล (ชู)

**Director Data&MIS**

AutoX, SCB Group

## Education

- DPU CITE  
Ph.D. Information Technology
- NIDA  
Mini Business Analysis & Data Science
- THAMMASAT  
M.Sc. Management Information System
- KMUTT  
B.Sc. Computer Science

## Expreience

- CJ Express Group, (TILDI)  
Product Owner, Data & AI
- Deloitte  
Assoc. Director Financial Advisory
- SCB  
AVP, Analytics Development Manager & Data Coach
- DTAC  
Data Analyst, Customer Insight
- AIS  
Programmer Analyst

# Data Types

**Quantitative** - Anything that has exact numbers or measurement.

For example, Effort in points: 0, 1, 2, 3, 5, 8, 13.  
Duration in days: 1, 4, 666.

## Qualitative

- **Ordered** - Anything that can be compared and ordered.

User Story Priority: Must Have, Great, Good, Not Sure.  
Days: Mon, Tue, Wed, Thu, Fri, Sat, Sun.

- **Qualitative / Categorical** - Everything else.

Entity types: Bugs, Stories, Features, Test Cases.  
Fruits: Apples, Oranges, Plums.

# Dimension & Measurement

## Dimension

## Measurement

Fact Row  
 →  
 Fact Row  
 →  
 Fact Row  
 →  
 ·  
 ·  
 ·

Category	Sales	Profit
Appliances	1,380,025.62	190,138.91
Binders and Binder Accessories	2,069,940.09	463,321.64
Bookcases	1,238,471.60	-50,614.13
Chairs & Chairmats	2,974,242.23	211,188.01
Computer Peripherals	1,746,036.45	166,603.07
Copiers and Fax	2,255,437.19	314,610.14
Envelopes	288,668.60	59,707.80
Labels	64,716.32	16,211.12
Office Furnishings	1,174,637.73	197,218.55
Office Machines	3,650,587.36	385,906.40
Paper	928,997.06	60,214.44
Pens & Art Supplies	318,489.07	21,680.74
Rubber Bands	43,513.44	322.49
Scissors, Rulers and Trimmers	117,802.18	-10,590.34
Storage & Organization	1,866,441.74	9,420.00
Tables	3,395,153.29	-127,160.04
Telephones and Communication	3,555,295.50	640,058.07

# Dashboard Design Patterns

Benjamin Bach, Euan Freeman,  
Alfie Abdul-Rahman, Cagatay Turkey,  
Saiful Khan, Yulei Fan, Min Chen



Visual+  
Interactive  
Data

design  
informatics



THE UNIVERSITY  
of EDINBURGH



University  
of Glasgow

THE UNIVERSITY OF  
WARWICK



UNIVERSITY OF  
OXFORD

# What Do We Talk About When We Talk About Dashboards?

Alper Sarikaya, Michael Correll, Lyn Bartram, Melanie Tory, and Danyel Fisher

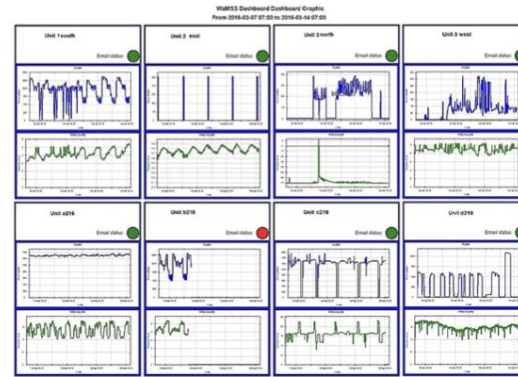
Goal	Cluster	# Examples	Purpose				Audience			Visual Features				Data Semantics			
			Strategic	Tactical	Operational	Learning	Audience	Vis Literacy	Domain Expertise	Construction	Interactivity	Modify Data/World	Highlighting	Multipage	Alerting+Notification	Benchmarks	Updateable
Decision-Making	1 Strategic Decision-Making	16	Y	Y	-	N	O	-	-	-	Y	N	N	Y	-	-	Y
	5 Operational Decision-Making	14	N	Y	Y	N	O	-	-	-	Y	N	N	Y	-	Y	Y
Awareness	3 Static Operational	10	N	N	Y	N	O	L	-	-	-	N	N	N	-	Y	Y
	4 Static Organizational	8	-	-	N	N	O	M	-	N	N	N	-	N	N	-	Y
Motivation and Learning	2 Quantified Self	7	N	N	Y	N	I	H	N	N	Y	N	-	Y	-	-	Y
	6 Communication	13	-	-	-	Y	P	M	N	N	-	N	-	-	N	N	Y
	7 Dashboards Evolved	15	-	-	-	-	P	H	-	-	-	-	-	-	-	-	Y



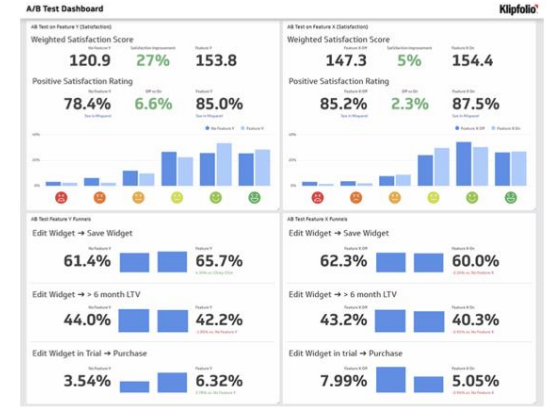
1 Strategic decision-making (DB052)



2 Quantified Self (DB021)



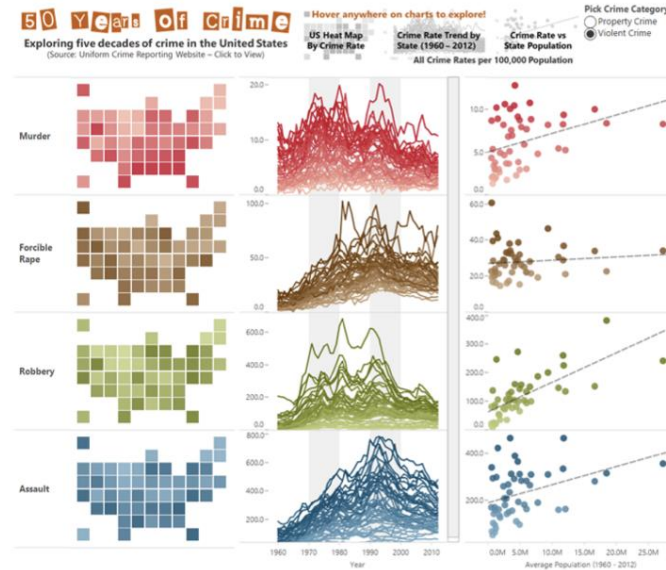
3 Static Operational (DB034)



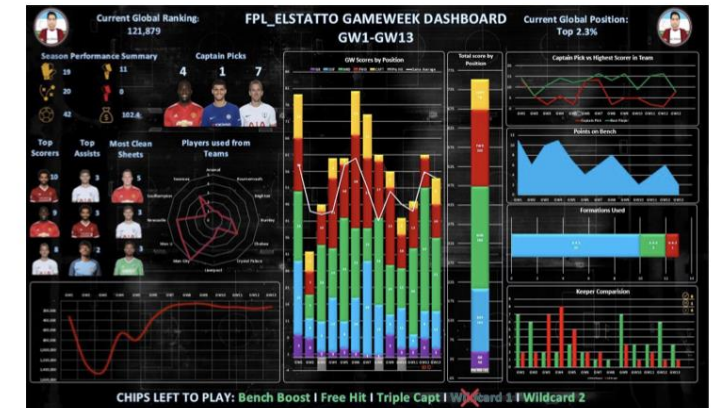
4 Static Organizational (DB101)



5 Operational decision-making (DB036)



6 Communication (DB005)



7 Dashboards Evolved (DB045)

## Scotland Nation Overview

2021-01-11

### Cases

#### Cumulative

Jan 24, 2022

16M

#### Daily Cases

Jan 24, 2022

60.9k

Max: 246.4k 2021-12-29  
Min: 0k 2020-02-22

down by 22656

#### New Cases

1,875

Today

up by 93  
From yesterday



Last 14 Days

#### Covid 19 Deaths

5,023

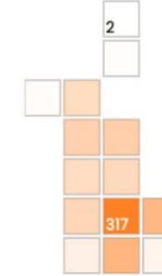
Total

up by 54  
From yesterday

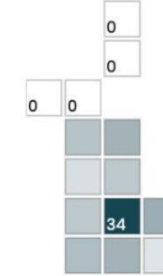


Last 14 Days

#### Cumulative Deaths per NHS Board



#### Covid19 Pat. in ICU per NHS Board



# How to visualize?

# How to use screenspace?

# How to structure information?

# How to layout?

# How to apply interactivity?

# How to use color?

### Vaccinations

#### Total 1st Dose Uptake

Jan 24, 2022

52.3M

Total



#### Total 2nd Dose Uptake

Jan 24, 2022

48.2M

Total



#### Total 3rd Dose / Booster

Jan 24, 2022

37M

Total



#### Daily 2nd

Jan 24, 2022

29.8k

New today

down by 8 since yesterday

#### Daily 3rd Dose / Boosters

Jan 24, 2022

55.9k

New today

up by 13153 since yesterday



Last 14 day(s)

### Hospital

#### Covid19 Patients in ICU

### Testing

#### Daily Tests

5 12th Scotland

up by 214  
From yesterday



Last 14 Days

### Deaths

#### Covid19 related deaths (weekly)

29 12th Scotland

This week

down by 4  
From last week



Last 8 Weeks

#### All Deaths (weekly)

184 12th Scotland

This week

up by 8  
From last week



Last 8 Weeks

#### Covid19 Patients in Hospital, Normalized

10.6 per 100,000

Current

no change

From yesterday






















Last 14 Days

2021-01-12



# 23 Dashboard Design Patterns

## Content Dashboard Design Patterns

Data	Meta Data	Visual Representation
<p><b>Less Data</b></p>  <p>Single value</p>  <p>Derived values</p>  <p>Thresholds</p>  <p>Filtered</p>  <p>Aggregated</p>  <p>Detailed Data</p> <p><b>More Data</b></p>	<p> Data Source</p> <p> Disclaimer</p> <p> Data Description</p> <p> Update Information</p> <p> Annotations</p>	<p><b>More Detail</b></p> <div style="border: 1px solid gray; border-radius: 10px; padding: 5px; display: inline-block;">  List              Table         </div> <p> Detailed Visualization</p> <p> Miniature Chart</p> <p> Progress Bars &amp; Gauge</p> <p> Trend arrow</p> <p> Pictogram</p> <p> 42</p> <p><b>Less Detail</b></p>



Cases by States Jul 10, 2021

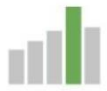
#		TOTAL		DEATHS
				
Selangor		281,670	↑ 4277	1,983
Kuala Lumpur		87,711	↑ 1398	662
Johor		74,436	↑ 399	637
Sabah		72,042	↑ 251	559
Sarawak		68,599	↑ 352	431
Negeri Sembilan		51,851	↑ 638	466
P. Pinang		36,376	↑ 180	129
Kelantan		35,991	↑ 89	240
Perak		28,903	↑ 145	140
Kedah		28,202	↑ 364	240
Melaka		21,009	↑ 247	196
Pahang		15,848	↑ 247	144
Terengganu		11,721	↑ 50	82
Labuan		9,087	↑ 85	135
Putrajaya		2,550	↑ 39	15
Perlis		607	↑ 4	8
<b>Total</b>		<b>826603</b>		<b>6067</b>

# 23 Dashboard Design Patterns

## Content Dashboard Design Patterns

### Data

#### Less Data



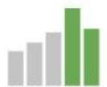
Single value



Derived values



Thresholds



Filtered



Aggregated



Detailed Data

#### More Data

### Meta Data



Data Source



Disclaimer



Data Description



Update Information



Annotations

### Visual Representation

#### More Detail



List



Table



Detailed Visualization



Miniature Chart



Progress Bars & Gauge



Trend arrow



Pictogram

42

Number

#### Less Detail



Last 14 Days



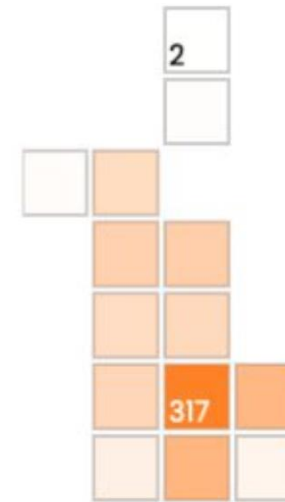
Last 14 Days



Last 14 Days

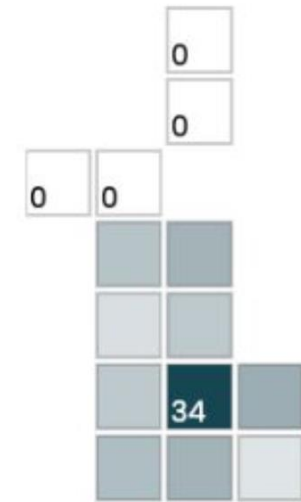
### Cumulative Deaths

per NHS Board



### Covid19 Pat. in ICU

per NHS Board



# 23 Dashboard Design Patterns

## Content Dashboard Design Patterns

### Data

#### Less Data



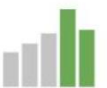
Single value



Derived values



Thresholds



Filtered



Aggregated



Detailed Data

#### More Data

### Meta Data



Data Source



Disclaimer



Data Description



Update Information



Annotations

### Visual Representation

#### More Detail



List



Table



Detailed Visualization



Miniature Chart



Progress Bars & Gauge



Trend arrow



Pictogram

42

Number

#### Less Detail



58.3%

WEEKLY TREND -1.6%



# 23 Dashboard Design Patterns

## Content Dashboard Design Patterns

### Data

#### Less Data



Single value



Derived values



Thresholds



Filtered



Aggregated



Detailed Data

#### More Data

### Meta Data



Data Source



Disclaimer



Data Description



Update Information



Annotations

### Visual Representation

#### More Detail



List Table



Detailed Visualization



Miniature Chart



Progress Bars & Gauge



Trend arrow



Pictogram

42

Number

#### Less Detail

### Page Layout



Open



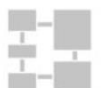
Table



Stratified



Grouped



Schematic

## Composition Dashboard Design Patterns

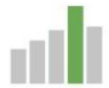


# 23 Dashboard Design Patterns

## Content Dashboard Design Patterns

### Data

#### Less Data



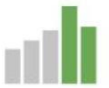
Single value



Derived values



Thresholds



Filtered



Aggregated



Detailed Data

#### More Data

### Meta Data



Data Source



Disclaimer



Data Description



Update Information



Annotations

### Visual Representation

#### More Detail



List



Table



Detailed Visualization



Miniature Chart



Progress Bars & Gauge



Trend arrow



Pictogram

42

Number

#### Less Detail

### Page Layout



Open



Table



Stratified

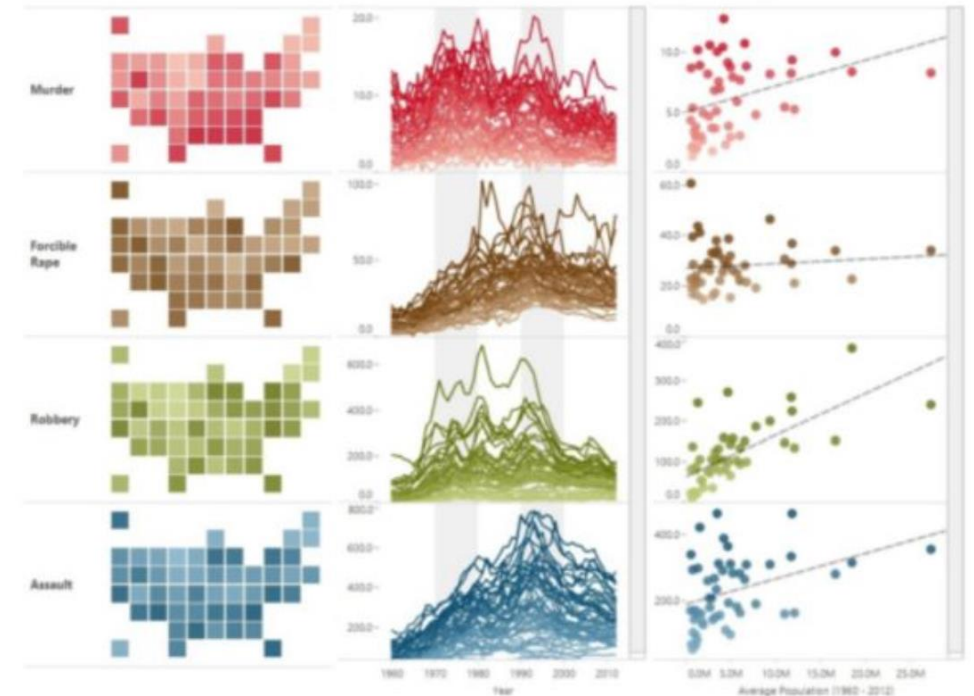


Grouped



Schematic

## Composition Dashboard Design Patterns



# 23 Dashboard Design Patterns

## Content Dashboard Design Patterns

### Data

Less Data



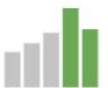
Single value



Derived values



Thresholds



Filtered



Aggregated



Detailed Data

More Data

### Meta Data



Data Source



Disclaimer



Data Description



Update Information



Annotations

### Visual Representation

More Detail



List



Table



Detailed Visualization



Miniature Chart



Progress Bars & Gauge



Trend arrow



Pictogram

42

Number

Less Detail

### Page Layout



Open



Table



Stratified



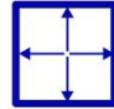
Grouped



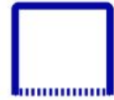
Schematic

## Composition Dashboard Design Patterns

### Screenspace



Screenfit



Overflow



Detail on demand



Parameterization



Multiple pages

# 23 Dashboard Design Patterns

## Content Dashboard Design Patterns

### Data

#### Less Data



Single value



Derived values



Thresholds



Filtered



Aggregated



Detailed Data

#### More Data

### Meta Data



Data Source



Disclaimer



Data Description



Update Information



Annotations

### Visual Representation

#### More Detail



List



Table



Detailed Visualization



Miniature Chart



Progress Bars & Gauge



Trend arrow



Pictogram

42

Number

#### Less Detail

## Composition Dashboard Design Patterns

### Page Layout



Open



Table



Stratified

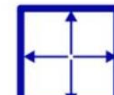


Grouped

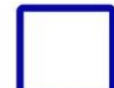


Schematic

### Screenspace



Screenfit



Overflow



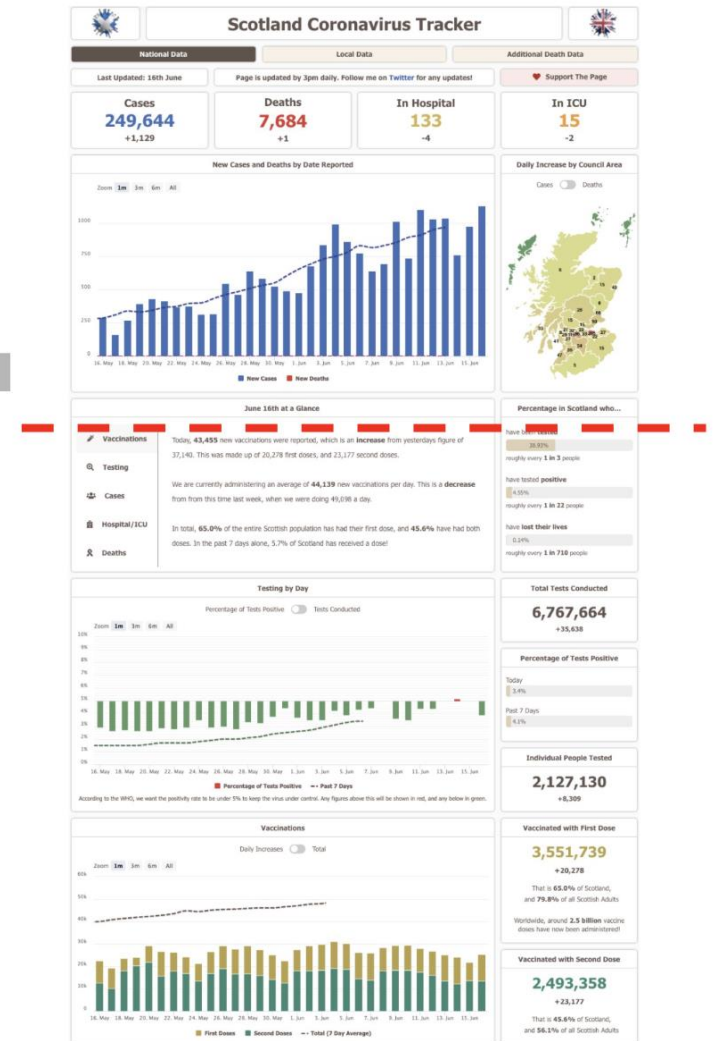
Detail on demand



Parameterization



Multiple pages



# 23 Dashboard Design Patterns

## Content Dashboard Design Patterns

### Data

Less Data



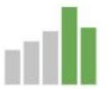
Single value



Derived values



Thresholds



Filtered



Aggregated



Detailed Data

More Data

### Meta Data



Data Source



Disclaimer



Data Description



Update Information



Annotations

### Visual Representation

More Detail



List



Table



Detailed Visualization



Miniature Chart



Progress Bars & Gauge



Trend arrow



Pictogram

42

Number

Less Detail

### Page Layout



Open



Table



Stratified

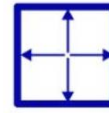


Grouped

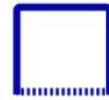


Schematic

### Screenspace



Screenfit



Overflow



Detail on demand



Parameterization



Multiple pages

## Composition Dashboard Design Patterns

Wählen Sie ein Land, Kontinent, Bundesland oder Kreis

🔍 Deutschland



Sieben-Tage-Inzidenz

**20,4** ↘

2.719 Fälle heute  
Wochentrend: -40 %

Stand: 10. Juni

**2.719** ↘

**Fälle heute**  
3.717.842 gesamt

**93** ↘

**Todesfälle heute**  
90.280 gesamt

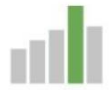


# 23 Dashboard Design Patterns

## Content Dashboard Design Patterns

### Data

Less Data



Single value



Derived values



Thresholds



Filtered



Aggregated



Detailed Data

More Data

### Meta Data



Data Source



Disclaimer



Data Description



Update Information



Annotations

### Visual Representation

More Detail



List



Table



Detailed Visualization



Miniature Chart



Progress Bars & Gauge



Trend arrow



Pictogram

42

Number

Less Detail

## Composition Dashboard Design Patterns

### Page Layout



Open



Table



Stratified

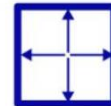


Grouped

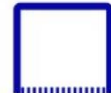


Schematic

### Screenspace



Screenfit



Overflow



Detail on demand



Parameterization



Multiple pages

### Structure



Single Page



Parallel



Hierarchic



Open

# 23 Dashboard Design Patterns

## Content Dashboard Design Patterns

### Data

Less Data



Single value



Derived values



Thresholds



Filtered



Aggregated



Detailed Data

More Data

### Meta Data



Data Source



Disclaimer



Data Description



Update Information



Annotations

### Visual Representation

More Detail



List



Table



Detailed Visualization



Miniature Chart



Progress Bars & Gauge



Trend arrow



Pictogram

42

Number

Less Detail

## Composition Dashboard Design Patterns

### Page Layout



Open



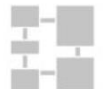
Table



Stratified

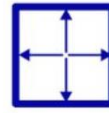


Grouped



Schematic

### Screenspace



Screenfit



Overflow



Detail on demand



Parameterization



Multiple pages

### Structure



Single Page



Parallel



Hierarchic



Open

### Interaction



Exploration



Navigation



Personalization



Drilldown

# 23 Dashboard Design Patterns

## Content Dashboard Design Patterns

### Data

Less Data



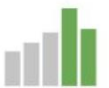
Single value



Derived values



Thresholds



Filtered



Aggregated



Detailed Data

More Data

### Meta Data



Data Source



Disclaimer



Data Description



Update Information



Annotations

### Visual Representation

More Detail



List



Table



Detailed Visualization



Miniature Chart



Progress Bars & Gauge



Trend arrow



Pictogram

42

Number

Less Detail

## Composition Dashboard Design Patterns

### Page Layout



Open



Table



Stratified

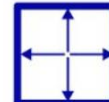


Grouped



Schematic

### Screenspace



Screenfit



Overflow



Detail on demand



Parameterization



Multiple pages

### Structure



Single Page



Parallel



Hierarchic



Open

### Interaction



Exploration



Navigation



Personalization



Drilldown

### Color



Distinct



Data Encoding



Semantic



Emotive

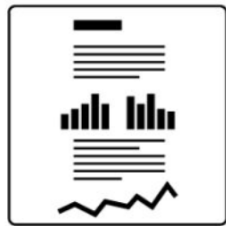
# 7 Dashboard Genres



Static



Analytical



Magazine



Infographic



Mini



Slideshow



Repository

# 7 Dashboard Genres



Static



Analytical



Magazine



Infographic



Mini



Slideshow



Repository

## US coronavirus data

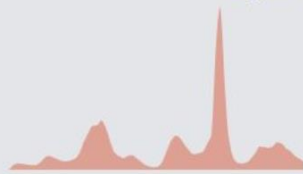
Hide

### New cases

14-day average on 15 Oct  
39,197

**-25%**

Change in past 14 days



Cases by state →

### New deaths

14-day average on 15 Oct  
377

**-14%**

Change in past 14 days



Deaths by state →

### Fully vaccinated

At least one dose

Total pop.	65.4%	76.8%
Age 12+	73.8%	86.5%
Age 65+	88.9%	95.0%

Vaccinations by state →

# 7 Dashboard Genres



Static



Analytical



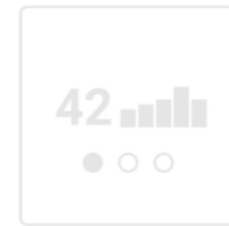
Magazine



Infographic



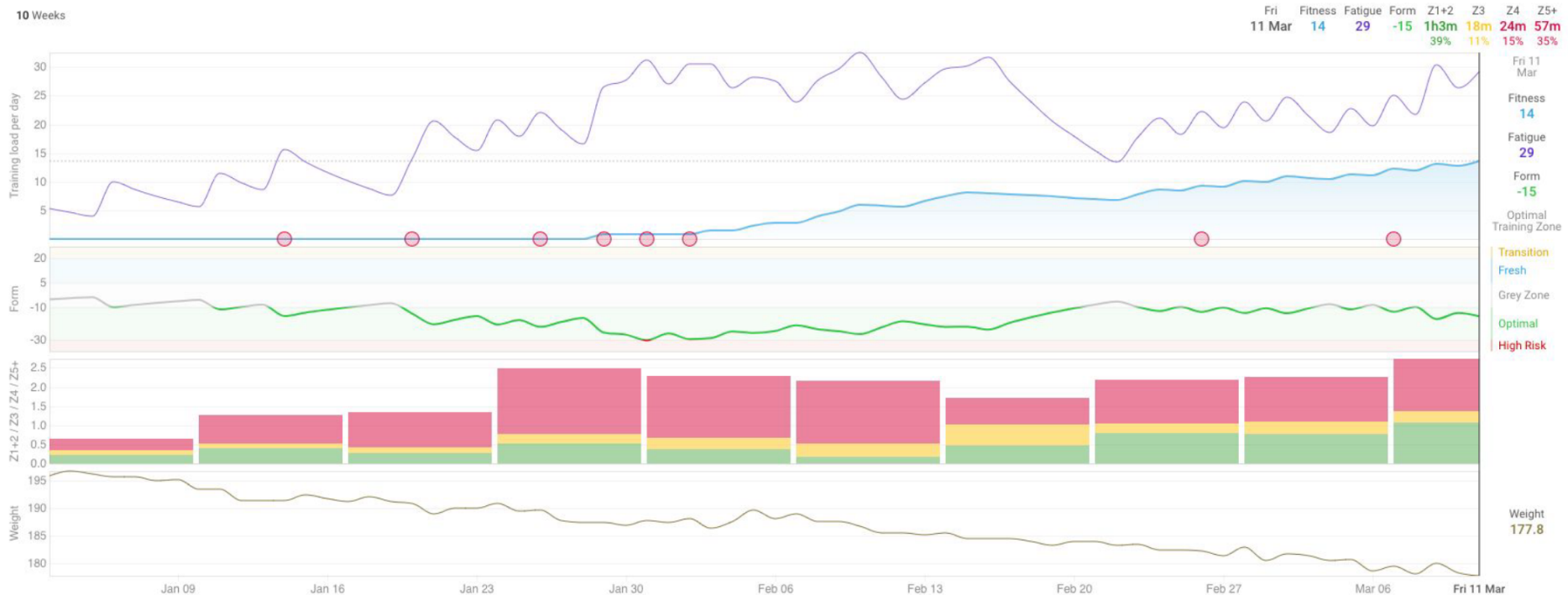
Mini



Slideshow



Repository



The blue line shows fitness. This is a 42 day exponentially weighted moving average of your training load. The purple line shows fatigue. This is a 7 day exponentially weighted moving average of your training load above the blue line. Your form is your fitness less fatigue. When your form is in the optimal training zone you are gaining fitness. When your form is fresh and you are fit then you are ready to race. Avoid staying in 1 weeks in your training to recover from fatigue and to be at your best for goal events. References: [Monitoring your training load by Science2Sport](#) and [Managing Training Using TSB by Joe Friel](#)

Fri 11 Mar 2022 09:24 AM Avg HR Intensity Pace Load Weight  
 5.78 km 29m02s 175 99% 5:01/km 48 80.648  
 Morning Run ~ 2x 8m4s 178bpm 3m53s 182bpm

# 7 Dashboard Genres



Static



Analytical



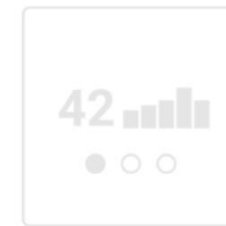
Magazine



Infographic



Mini



Slideshow

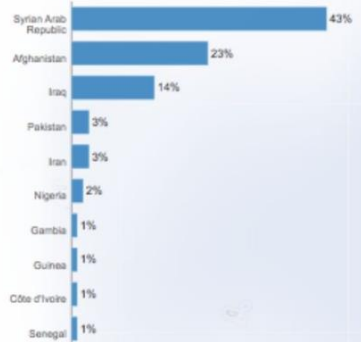


Repository

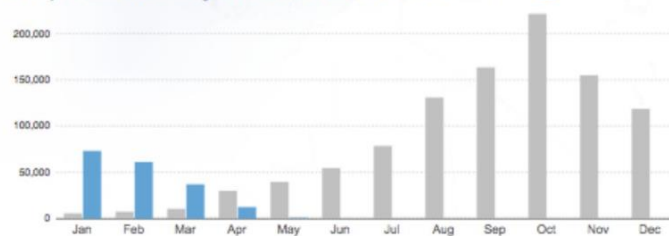
Increasing numbers of refugees and migrants take their chances aboard unseaworthy boats and dinghies in a desperate bid to reach Europe. The vast majority of those attempting this dangerous crossing are in need of international protection, fleeing war, violence and persecution in their country of origin. Every year these movements continue to exact a devastating toll on human life.

## Top-10 nationalities of Mediterranean sea arrivals

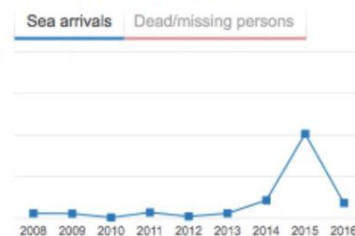
Top-10 nationalities represent **92%** of the sea arrivals based on arrivals since 1 Jan 2016



## Comparison of monthly Mediterranean sea arrivals



## Evolution - Mediterranean Sea

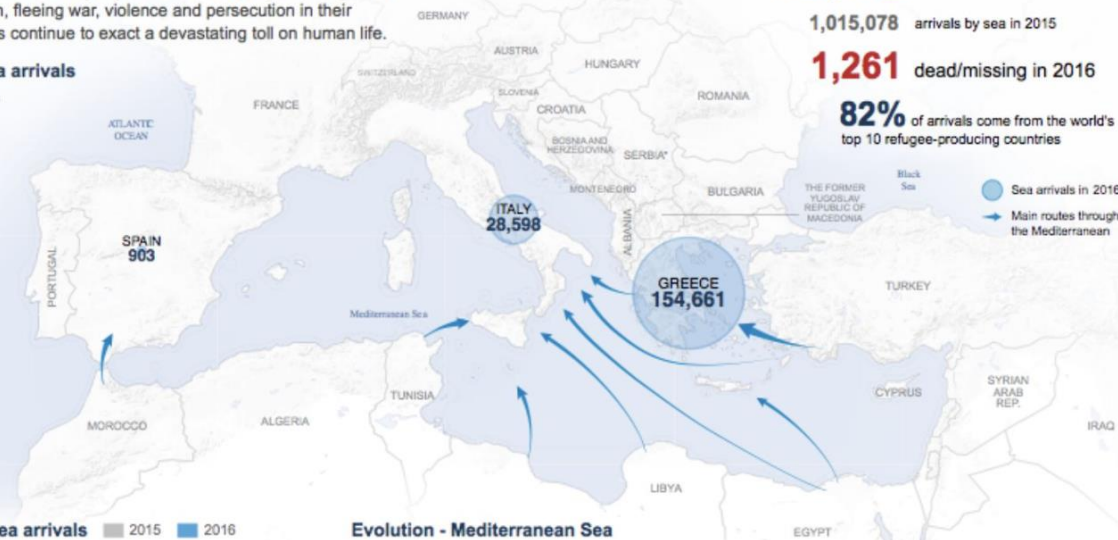


**184,162** arrivals by sea in 2016

**1,015,078** arrivals by sea in 2015

**1,261** dead/missing in 2016

**82%** of arrivals come from the world's top 10 refugee-producing countries



## Demographics based on arrivals since 1 Jan 2016



\*Serbia (AND KOSOVO): S/RES/1244 (1999)

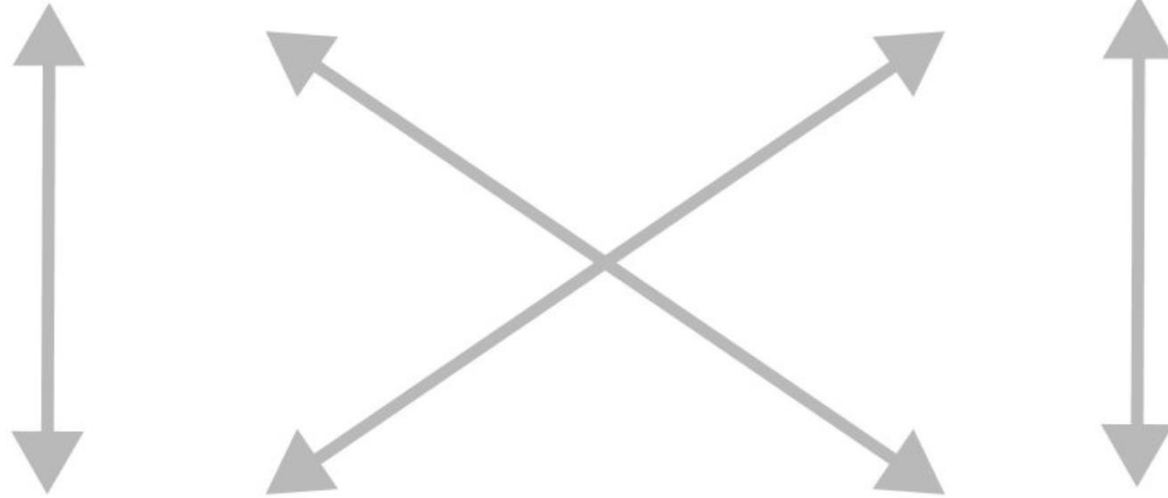
The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations

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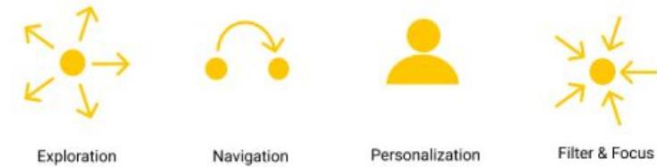


# Screenspace

# Pages



# Interaction







<https://bit.ly/3ABHsRD>