

# Grupo DataHealth

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# Tema

- Mostrar quão a saúde mental impacta o suicídio nos países.



# Objetivo

- Verificar a relação entre as grandes doenças mentais, como depressão e ansiedade, podem estar relacionadas com as taxas de suicídios pelos países.



# Bases de dados

<https://ourworldindata.org/suicide>

## ▼ All our charts on Suicide

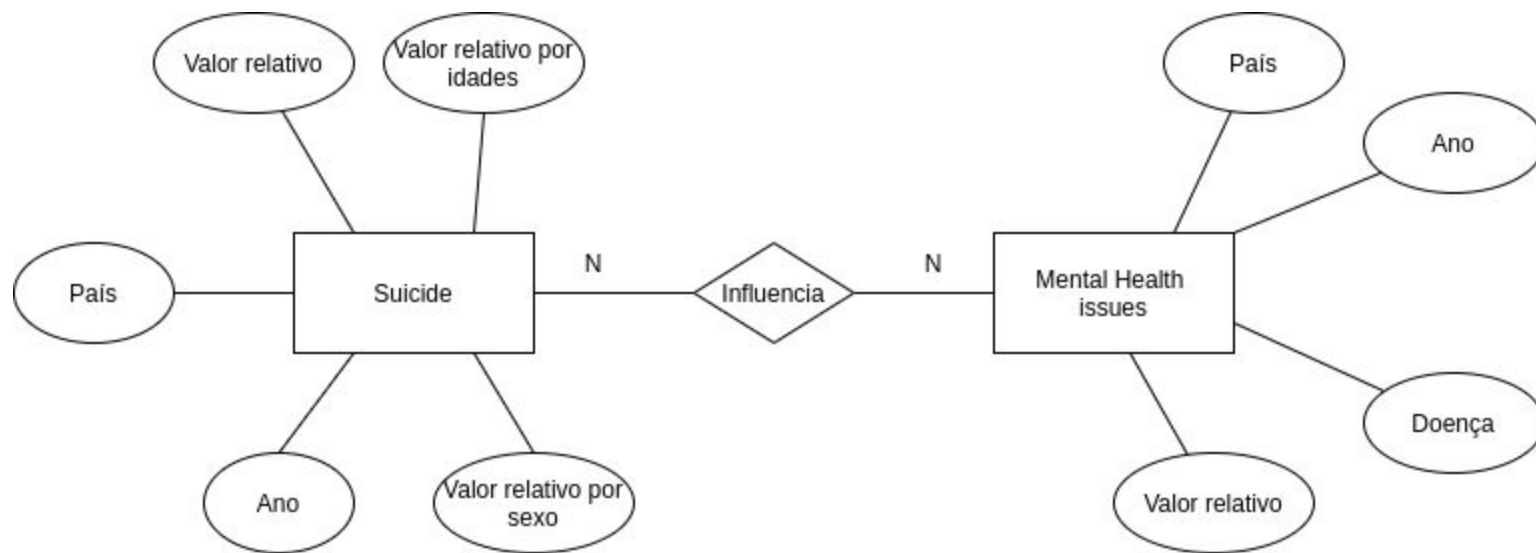
- **Death rate from suicides** IHME (1990 to 2016)
- Deaths from suicide, by age
- Male and female suicide rate
- Male vs. female suicide rate
- Male-to-female ratio of suicide rates
- National suicide rates and mean years of schooling in population over age 15
- Number of suicide deaths from firearms
- Share of deaths from suicide
- Share of suicide deaths from pesticide poisoning
- Suicide and life satisfaction across countries
- Suicide death rate by age
- Suicide death rates World Bank (2000 to 2016)
- Suicide death rates by sex
- Suicide rate World Bank (2000 to 2016)
- Suicide rate by firearm
- Suicide rate in 1990 vs. 2017
- Suicide rate vs self-reported life satisfaction
- Suicide rate vs. death rate from violence (per 100,000)
- Suicide rate vs. homicide rate
- Suicide rate vs. income inequality
- Suicide rates by age
- Suicide rates by country WHO (1950 to 2005)
- Suicide rates vs. prevalence of depression

<https://ourworldindata.org/mental-health>

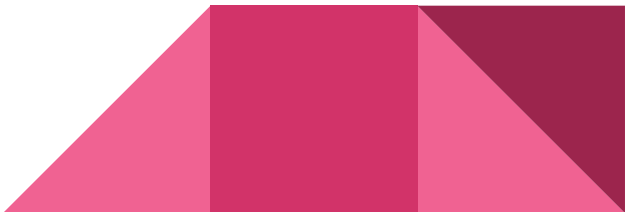
## ▼ All our charts on Mental Health

- **Anxiety disorder DALYs, age-standardized rate**
- Bipolar disorder DALYs, age-standardized rate
- DALY rates from anxiety disorders by age
- DALY rates from bipolar disorder by age
- DALY rates from schizophrenia by age
- DALYs (Disability-Adjusted Life Years) from mental and neurodevelopmental disorders
- DALYs from eating disorders by age
- DALYs from mental health and substance use disorder by age
- DALYs from mental health and substance use disorders
- DALYs from mental health and substance use disorders
- Death rates from eating disorders
- Death rates from mental health and substance use disorders
- Death rates from mental health and substance use disorders by age
- Deaths from eating disorders
- Deaths from mental health and substance use disorders
- Depression prevalence by level of education & employment
- Depressive disorder DALY rates by age
- Depressive disorder DALYs, age-standardized rate
- Disability-adjusted life years: Major depressive disorders, age-standardized rate
- Disability-adjusted life years: Mental and substance use disorders, age-standardized rate
- Eating disorder DALYs, age-standardized rate
- Mental and substance use disorders as a share of total disease burden
- Mental health disorders as a share of total disease burden
- Number of people with an eating disorder
- Number of people with an eating disorder
- Number of people with anxiety disorders
- Number of people with anxiety disorders
- Number of people with attention deficit/hyperactivity disorder (ADHD)
- Number of people with bipolar disorder
- Number of people with bipolar disorder
- Number of people with depression
- Number of people with depression by country
- Number of people with depression, by region

# Modelo Conceitual



# Tabelas

- MentalHealthDisorders
  - DisordersByAge
    - 15-49
    - 50-69
    - 70+
  - ShareDeathsSuicide
  - RatesDeathsSuicide
  - RatesDetailedDeathsSuicide
    - 5-14
    - 15-49
    - 50-69
    - 70+
- 

# Queries SQL

# Top 3 doenças que mais aparecem nos países com maior e menor taxa de suicídio.

```
DROP VIEW IF EXISTS maioresTaxas;
```

```
CREATE VIEW maioresTaxas AS
select top 10 pais, AVG(RatesDeaths) as media from RatesDeathsSuicide
group by pais
order by media desc
```

```
DROP view IF EXISTS maioresDoencas;
```

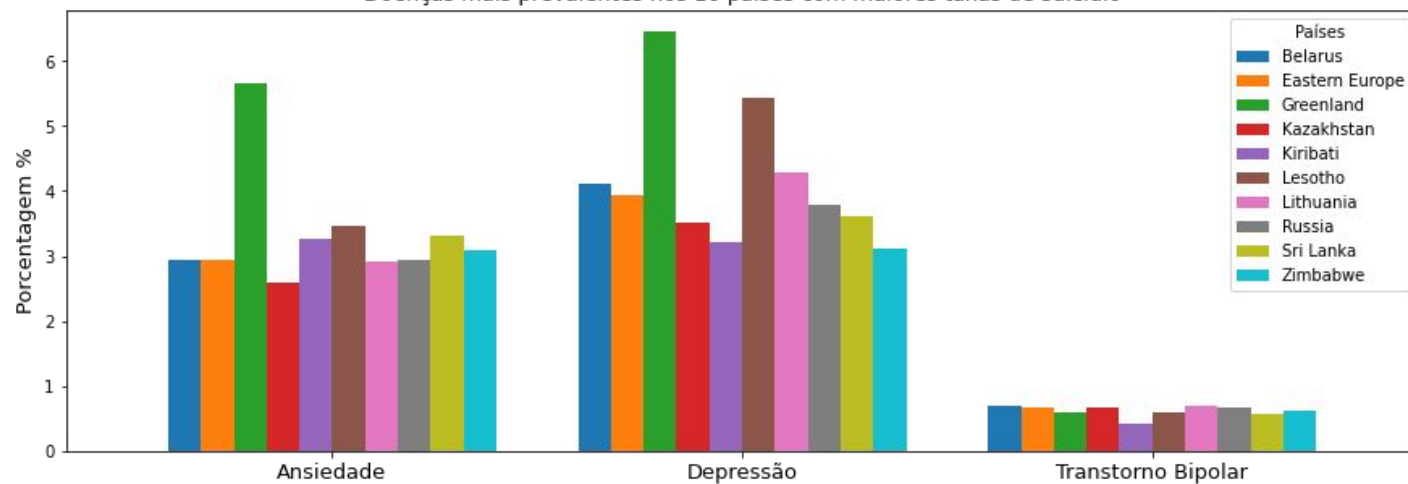
```
CREATE view maioresDoencas as
select country, disease, AVG(share) as mediaTaxa from MentalHealthDisorders
group by country, disease
order by country, mediaTaxa desc
```

```
select md1.country, md1.disease, md1.mediaTaxa from maioresDoencas as md1, maioresTaxas
where md1.disease in (select top 3 md2.disease from maioresDoencas as md2
                      where md1.country = md2.country
                      order by mediaTaxa desc)
and md1.country = maioresTaxas.pais
```

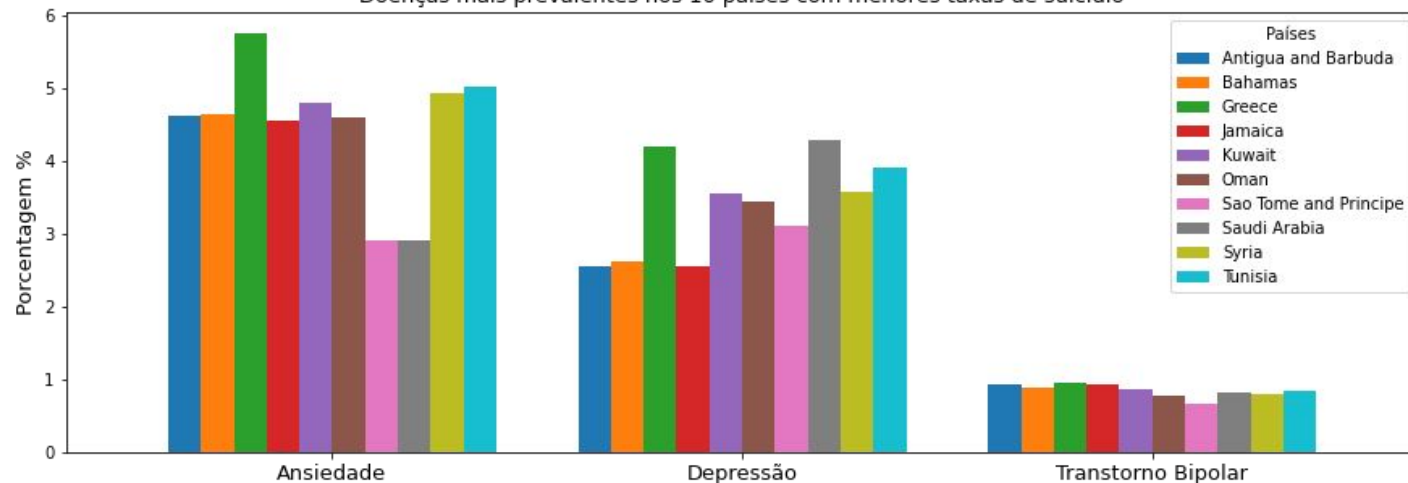
index	COUNTRY	DISEASE	MEDIATAXA	index	COUNTRY	DISEASE	MEDIATAXA
0	Greenland	Depressão	6.459108779363213	0	Jamaica	Ansiedade	4.565916769595
1	Greenland	Ansiedade	5.669651463066429	1	Jamaica	Depressão	2.5600966188882
2	Greenland	Transtorno Bipolar	0.592051538500428	2	Jamaica	Transtorno Bipolar	0.9240903804162
3	Russia	Depressão	3.791145334255357	3	Antigua and Barbuda	Ansiedade	4.62242720984
4	Russia	Ansiedade	2.941674424543214	4	Antigua and Barbuda	Depressão	2.5579151358317
5	Russia	Transtorno Bipolar	0.672070896094393	5	Antigua and Barbuda	Transtorno Bipolar	0.9235826971910
6	Lithuania	Depressão	4.281545679077857	6	Saudi Arabia	Ansiedade	4.7102110835114
7	Lithuania	Ansiedade	2.9189305418150004	7	Saudi Arabia	Depressão	3.4677971592682
8	Lithuania	Transtorno Bipolar	0.695013263243821	8	Saudi Arabia	Transtorno Bipolar	0.8096494495203
9	Eastern Europe	Depressão	3.935313363843929	9	Kuwait	Ansiedade	4.8019097214210
10	Eastern Europe	Ansiedade	2.936798724274644	10	Kuwait	Depressão	3.5567873041103
11	Eastern Europe	Transtorno Bipolar	0.676901875824607	11	Kuwait	Transtorno Bipolar	0.8565444786631
12	Sri Lanka	Depressão	3.609633908995715	12	Bahamas	Ansiedade	4.6499755268360
13	Sri Lanka	Ansiedade	3.312963307914285	13	Bahamas	Depressão	2.6311664568257
14	Sri Lanka	Transtorno Bipolar	0.561876932184571	14	Bahamas	Transtorno Bipolar	0.8876945854736
15	Kazakhstan	Depressão	3.519792423874285	15	Sao Tome and Principe	Depressão	3.1166737517364
16	Kazakhstan	Ansiedade	2.592606891653928	16	Sao Tome and Principe	Ansiedade	2.9070706155839
17	Kazakhstan	Transtorno Bipolar	0.662547878055785	17	Sao Tome and Principe	Transtorno Bipolar	0.6581072357913
18	Lesotho	Depressão	5.423810809898572	18	Syria	Ansiedade	4.9318120978117
19	Lesotho	Ansiedade	3.462148240136071	19	Syria	Depressão	3.5686295560217
20	Lesotho	Transtorno Bipolar	0.603013904891857	20	Syria	Transtorno Bipolar	0.8053841240805
21	Belarus	Depressão	4.106998954844285	21	Greece	Ansiedade	5.7583028323978
22	Belarus	Ansiedade	2.933313848739642	22	Greece	Depressão	4.2074954730046
23	Belarus	Transtorno Bipolar	0.695745525269821	23	Greece	Transtorno Bipolar	0.9454318894052
24	Zimbabwe	Depressão	3.103040412327857	24	Oman	Ansiedade	4.6084626227721



Doenças mais prevalentes nos 10 países com maiores taxas de suicídio



Doenças mais prevalentes nos 10 países com menores taxas de suicídio



# Qual a idade mais afetada pelas doenças mais prevalentes nos países com maior taxa de suicídio

```
DROP view IF EXISTS idadesAfetadas;
```

```
CREATE view idadesAfetadas as  
select country, disease, age, AVG(share) as mediaPorcentagem  
from DisordersByAge  
group by country, disease, age  
order by country, mediaPorcentagem desc
```

```
select md1.country, md1.disease, md1.age, md1.mediaPorcentagem  
from idadesAfetadas as md1, maioresTaxas  
where md1.age in (select top 1 md2.age from idadesAfetadas as md2  
                  where md1.country = md2.country  
                  order by mediaPorcentagem desc)  
and md1.country = maioresTaxas.pais
```

index	COUNTRY	DISEASE	AGE	MEDIAPORCENTAGEM
0	Greenland	Depressão	15-49	9.320678152752857
1	Greenland	Ansiedade	15-49	0.8026798690878572
2	Greenland	Transtorno Bipolar	15-49	0.802679869087857
3	Russia	Depressão	70+	8.177053367988215
4	Russia	Transtorno Bipolar	70+	0.5198128918701072
5	Russia	Ansiedade	70+	0.5198128918701072
6	Lithuania	Depressão	70+	8.859631416428213
7	Lithuania	Transtorno Bipolar	70+	0.5211122357915001
8	Lithuania	Ansiedade	70+	0.5211122357915
9	Eastern Europe	Depressão	70+	8.611153022269287
10	Eastern Europe	Transtorno Bipolar	70+	0.5201714798183928
11	Eastern Europe	Ansiedade	70+	0.5201714798183928
12	Sri Lanka	Depressão	70+	6.402081290287143
13	Sri Lanka	Transtorno Bipolar	70+	0.5755981494976429
14	Sri Lanka	Ansiedade	70+	0.5755981494976429
15	Kazakhstan	Depressão	70+	7.699461020053929
16	Kazakhstan	Ansiedade	70+	0.5187393886368928
17	Kazakhstan	Transtorno Bipolar	70+	0.5187393886368927
18	Lesotho	Depressão	70+	11.033590342332143
19	Lesotho	Transtorno Bipolar	70+	0.5150035348807858
20	Lesotho	Ansiedade	70+	0.5150035348807858
21	Belarus	Depressão	70+	8.773748143733929
22	Belarus	Transtorno Bipolar	70+	0.5189012566994287
23	Belarus	Ansiedade	70+	0.5189012566994285
24	Zimbabwe	Depressão	70+	7.3071833546410705

# Países que aumentaram/diminuíram as taxas

Índice	PAIS	ANO1	ANO2	RATESDEATHS
0	Russia	1992	1993	9.528686300974
1	Ukraine	2014	2015	8.308973611691
2	Eastern Europe	1992	1993	7.216143738940
3	Lithuania	1992	1993	6.619976159529
4	Latvia	1992	1993	6.170393334047
5	Russia	1993	1994	6.159068493146
6	Eastern Europe	1993	1994	5.052983561411
7	Estonia	1993	1994	4.995307747002
8	Russia	1991	1992	4.871073766070
9	Lithuania	1993	1994	4.685556828465
10	Estonia	1992	1993	4.600006035839
11	Latvia	1993	1994	4.383418832117
12	Central Europe, Eastern Europe, and Central Asia	1992	1993	4.037437357425
13	Eastern Europe	1991	1992	3.901863450551
14	Ukraine	1994	1995	3.774348238900
15	Russia	1998	1999	3.672231682479
16	Belarus	1992	1993	3.631601303118
17	Kazakhstan	1999	2000	3.385771431941
18	Kazakhstan	1994	1995	3.230638755707
19	Latvia	1991	1992	2.942556356235
20	Lithuania	1990	1991	2.899062542044
21	Central Europe, Eastern Europe, and Central Asia	1993	1994	2.846792918104
22	Zimbabwe	1999	2000	2.813241054520
23	Sri Lanka	1994	1995	2.732114661235
24	Eastern Europe	1998	1999	2.681435927622

```
DROP VIEW IF EXISTS AumentoEDiminuiçãoSuicide;
```

```
CREATE VIEW AumentoEDiminuiçãoSuicide AS  
SELECT RD.pais pais, RD.ano ano1, RD2.ano ano2, (RD2.RatesDeaths - RD.RatesDeaths) RatesDeaths  
FROM RatesDeathsSuicide RD, RatesDeathsSuicide RD2  
WHERE (RD.ano + 1) = RD2.ano AND RD.pais = RD2.pais  
ORDER BY RatesDeaths DESC;
```

```
SELECT * FROM AumentoEDiminuiçãoSuicide;
```

# Países que aumentaram/diminuíram as taxas médias

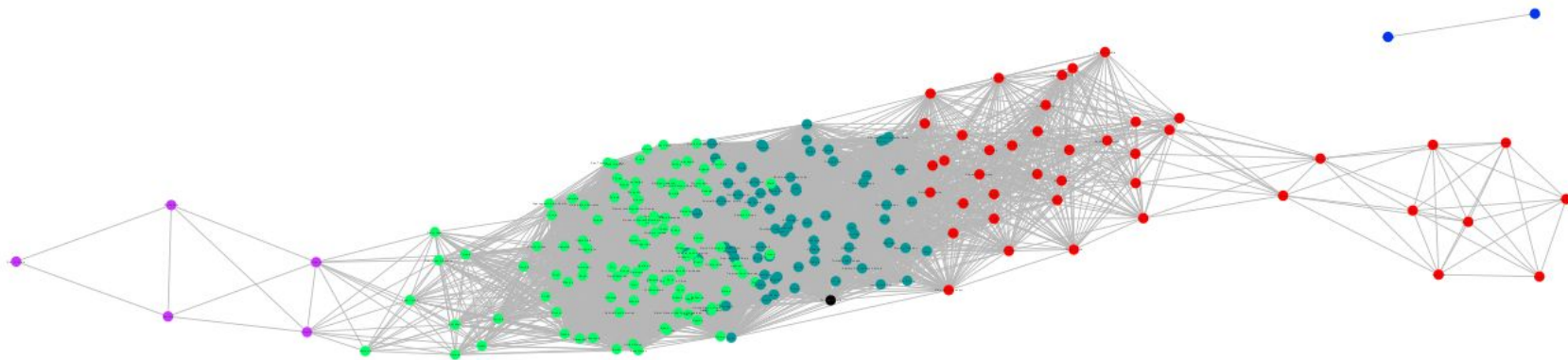
index	PAIS	MÉDIA
0	Australia	0.008999647361037035
1	Australasia	0.00794062049703704
2	Equatorial Guinea	0.006742611715129631
3	Singapore	0.00666716855651852
4	Ireland	0.006310824425111112
5	Spain	0.005786892602074072
6	Luxembourg	0.005532776868740739
7	Austria	0.005066100329592595
8	South Korea	0.00498645541748148
9	United States Virgin Islands	0.004862511867925926
10	Malta	0.004650683483148153
11	Netherlands	0.004580584864148147
12	Chile	0.00419716853459259
13	Portugal	0.00391442391637037
14	Sweden	0.003674290531000001
15	Turkey	0.0035361034501481463
16	England	0.0034617095169999982
17	United Kingdom	0.003451744428444446
18	Belgium	0.003431682917074075
19	Israel	0.0033787001130000023
20	Northern Ireland	0.0033698369932592593
21	Trinidad and Tobago	0.003338006266296296
22	Wales	0.0033275623552962985
23	Southern Latin America	0.0033274123264444445
24	Cyprus	0.003172337757148151

```
SELECT A.pais pais, AVG(A.rates) média
FROM AumentoEDiminuiçãoEsquizofrenia A
GROUP BY A.pais
having média IS NOT NULL
order by média desc
```

# Queries Neo4j

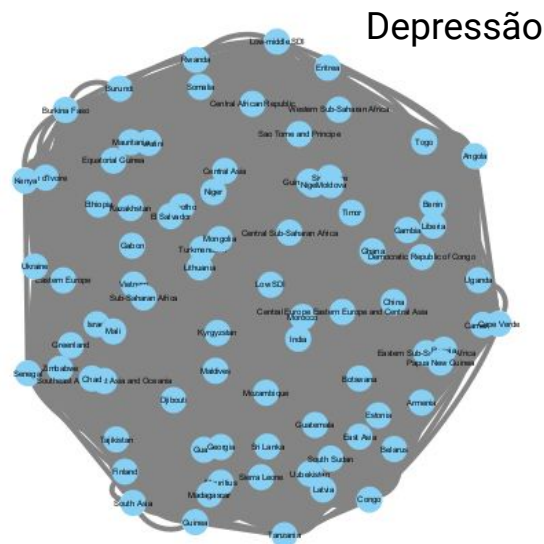
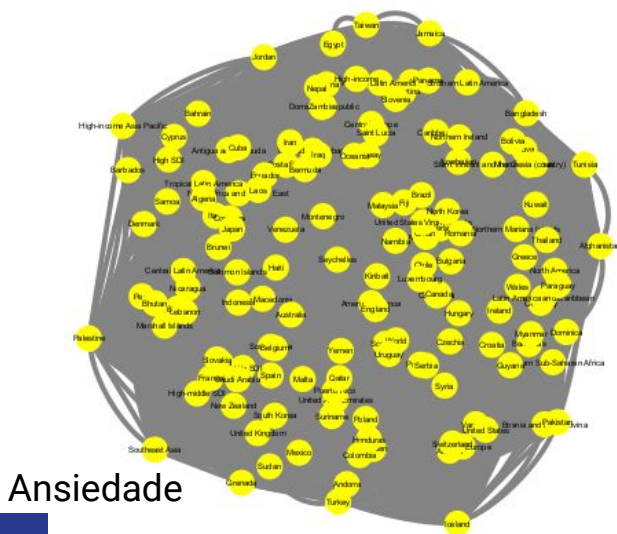
# Grafo ligando países com a taxa de crescimento próxima

```
MATCH (s1:Suicide)
MATCH (s2:Suicide)
where s2.media-s1.media<=0.1 and s2.media-s1.media>0
MERGE (s1)-[m:Maior]->(s2)
```



# Grafo ligando países com a mesma doença prevalente

```
MATCH (d1:Disease)
MATCH (d2:Disease)
where d1.doenca = d2.doenca and d1.name <> d2.name
MERGE (d1)-[p:Prevalente {doenca: d1.doenca}]->(d2)
```



# Desafios



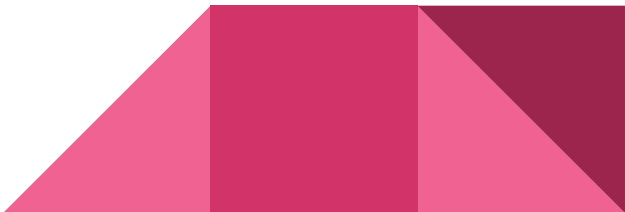
# Desafios

- Troca de tema por não obter dados necessários.
- Filtragem de dados(absolutos e relativos).
- Montar as queries relacionais, pois os dados das doenças estavam em colunas.
- Excesso de processamento no binder.



# Conclusões

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- Nos países com maior taxa de suicídio, observou-se uma maior prevalência de depressão.
  - De modo geral o suicídio diminuiu no mundo, em média os avanços mostraram se mais expressivos depois dos anos 2000.
  - Os países com maiores taxas de suicídio mostraram se com altas taxas de depressão. De acordo que ia diminuindo as taxas de suicídio, a ansiedade mostro se mais prevalente.
  - As taxas crescimento de doenças mentais, mostraram se ter mais crescimento durante os anos.
- 

# Conclusões

258	High SDI	Depressão	15-49	4.959238432436785
259	High SDI	Transtorno Bipolar	15-49	1.0125123745853573
260	High SDI	Ansiedade	15-49	1.012512374585357
261	High-income	Depressão	15-49	5.2560862248425
262	High-income	Ansiedade	15-49	1.0686812972221431
263	High-income	Transtorno Bipolar	15-49	1.068681297222143

- Os países com maior desenvolvimento, mostraram se ter mais ocorrência de suicídios na faixa etária de 15 a 49 anos. De modo geral, a maioria das doenças e suicídios mostraram se mais presentes com pessoas acima de 70 anos.
- Com alta diminuição de suicidio de um país, não podemos implicar que o contexto do país é positivo.

