PUBLIC HEALTH PROGRAMME
Oral health campaign in schools. Children teach the whole family how to brush properly.

If you are a child,
If you are not a child,

ANTIBIOTIC TREATMENT
Antibiotics cure bacterial infections, but they greatly disrupt the oral microbiota.

If you have a , remove it.
Then roll a and a in their balance value.
If not,

GOOD ORAL HEALTH
Brushing and flossing after eating promote good oral health.

If you brush correctly put a or a in its balance value.
If not,

GOOD ORAL HEALTH
Brushing and flossing after eating promote good oral health.

If you brush correctly put a or a in its balance value.
If not,

PROBIOTICS
Taking probiotics (living microorganisms in foods, such as yogurt, or supplements) helps building up beneficial bacteria and keep Candida at bay.

If you do not drink alcoholic beverages, place Candida or one in its balance value.
Instead, if you are smoker, or

PREBIOTICS
Prebiotics are complex carbohydrates and other compounds that our body cannot digest, but that stimulate the growth and activity of beneficial bacteria.

If you do not drink alcohol, place one or one in its balance value.
If you drink alcohol, or

VACCINES
Vaccines provide immunity against a specific disease and are the most effective method of preventing infectious diseases.

Put this card on the table. If during this round an epidemic card appears, you can cancel it and discard both cards; otherwise, discard this card at the end of the round.

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PROBIOTICS
Taking probiotics (living microorganisms in foods, such as yogurt, or supplements) helps building up beneficial bacteria and keep Candida at bay.

Or
and
PROBIOTICS

Taking probiotics (living microorganisms in foods, such as yogurt, or supplements) helps building up beneficial bacteria and keep Candida at bay.

If you are child,

If not, or

PREBIOTICS

Prebiotics are complex carbohydrates or other compounds that our body cannot digest, but that stimulate the growth and activity of beneficial bacteria.

You and the two players next to you, move one of your dice towards balance.

RESEARCH

Popular science

Good science communication empowers the population. An informed population thinks and decides wisely.

PROLONUED ANTIBIOTIC TREATMENT

Taking antibiotics long-term reduces the population of most species of bacteria and increases the growth of the yeast Candida.

If you have any , remove it.

Then, Also, if you have Down syndrome,

RESEARCH

Mass sequencing

Illumina’s new MiSeq sequencer analyzes 96 samples on each board and produces 30 million readings, generating 7 Gb of data.

If you have 3 dice in balance, remove

If you have 4 or more dice in balance, remove

PROLONUED ANTIBIOTIC TREATMENT

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If you have any , remove it.

Then, Also, if you have Down syndrome,

RESEARCH

Study population

You contact the Celiac Association and decide to collaborate to expand the study population. Your research advances.

Then recover from the discard pile an already played action card; you can play it right now or keep it for the next rounds.

RESEARCH

Pipetting robot

The new pipetting robot allows scientists to save a lot of time in preparing genetic libraries for the sequencer.

then, discover Veillonella. Roll the die to determine its initial value.

RESEARCH

Study population

New schools are added to the project. Your research advances.

Then, discover Gemella. Roll the die to determine its initial value.
RESEARCH
International conference
Introduction of new software for data analysis. The research advances.

Then, discover *Porphyromonas*. Roll the die to determine its initial value.

or

RESEARCH
Project renewal
The funding body grants new funding to the project.

Then,

or

RESEARCH
Postdoc hiring
A new postdoc expert in data analysis is hired.

Discover *Veillonella, Gemella* or *Porphyromonas*. Roll the die to determine its initial value

RESEARCH
Intern
A bioinformatics scholarship holder will support the research team for 6 months. Your research advances.

Discover *Veillonella, Gemella* or *Porphyromonas*. Roll the die to determine its initial value

VACUNACIÓ
Les vacunes proporcionen immunitat davant d’una determinada malaltia i són el mètode més eficaç de prevenir les malalties infeccioses.

ACCió
Deixa aquesta carta sobre la taula. Si en aquesta ronda apareix alguna carta d’epidèmia, pots anul·lar-la i descartar les dues cartes; si no, descarta aquesta carta al final de la ronda.

ORAL HYGIENE
Poor hygiene
Poor dental hygiene builds up plaque and anaerobic bacteria like *Prevotella, Porphyromonas* and *Veillonella*.

If you brush properly, increase only one.

If you floss, this card cannot cause you any.

INFECTION
Pneumonia
*Streptococcus pneumoniae* infection forces you to rest for a few days.

Receive

Moreover, if you have *cystic fibrosis*, receive

PLACE the die in one of your black boxes and roll it to determine its initial value.

INFECTION
Chronic periodontitis
Dental pulp infection. You need to combine two antibiotics to attack *Porphyromonas gingivalis* and *Aggregatibacter actinomycetemcomitans*.

Receive

and receive

PLACE the die in one of your black boxes with value = 1.
Give your *Streptococcus* the same value as the player to your right.

Then move

**HABITS**

**Toothbrush sharing**

Toothbrushes are full of bacteria. Sharing them will pass your bacteria on to other people and alter their oral microbiota.

Give your *Streptococcus* the same value as the player to your right.

**HABITS**

**Passive smoker**

Passive smoking is detrimental. Like active smokers, you can lose the sense of taste and smell.

If you are adult or teenager:

If you are senior or child:

**INFECTION**

**P. aeruginosa**

You get infected with *Pseudomonas aeruginosa*, an opportunistic pathogen with natural and acquired resistance to many commonly used antibiotics.

If you have *cystic fibrosis*, you get:

Put the die in one of your black squares; throw it to know its initial value.

If you do not have *cystic fibrosis*:

**EXTERNAL AGENTS**

**Roll all your dice showing value 2. Then receive \( \Delta \) for each die with value 6.**

**DIETARY CHANGES**

**Exotic trip**

Drinking different water and eating different foods alter your microbiota when traveling to different parts of the planet.

Decrease by 6 your dice (max. 2 per die).

Remember, you cannot decrease any black die.

**INFECTION**

**Viral**

You attempt to cure a viral infection with antibiotics (which only fight bacteria). You pointlessly alter your microbiota.

**INFECTION**

**Streptococcal stomatitis**

Bacterial infections might disrupt the oral microbiota.

**EXTERNAL AGENTS**

Apply the following increments:

- if you are *smoker*
- if you drink *alcoholic beverages*
- if you are adult or senior

**FOOD POISONING**

**Salmonella**

Salmonella can be found in raw meat, dairy products and eggshells.

Also, if you are a child or an adult,

Also, if you have *cystic fibrosis*

**LIFE IS TOUGH**

**Place the die in one of your black boxes and roll it to determine its initial value.**

**INFECTION**

**Candidiasis**

The fungus *Candida albicans* colonizes your mouth and establishes a synergy with *Streptococcus mutans*.

**EXTERNAL AGENTS**

Equalize *Streptococcus* and *Candida* to the higher value of the two.

If you do not *brush* properly, you also receive
Return to the reserve *Veillonella, Porphyromonas* or *Gemella*. In the next round you cannot receive any *action* card.

Next, reshuffle played and not yet drawn *event* cards, creating a new stack.

*Research problems*

The sequencer is broken. It takes two weeks to repair and research results are delayed.

Also, if you drink *sweet beverages*,

If you use *dental floss*, this card cannot cause you any damage.

*Poor hygiene*

*Streptococcus* and *Gemella* thrive with poor dental hygiene.

If you have *celiac disease*, you also get 

Put the dice in one of your black squares with value = 1.

*Plaque*

After each meal, food debris and bacteria stick to the teeth and form plaque. In the absence of good oral hygiene, plaque becomes tartar.

If you *brush* properly, only the dice with a value of 3.

If you *floss*, this card cannot cause you any damage.

*Hypoplasia*

Defect of tooth enamel often irreversible in untreated celiac disease.

*If you drink* sweet beverages, *this card cannot cause you any damage.*

*Flossing*

If you use *dental floss*, this card cannot cause you any damage.

*Research*

The sequencer is broken. It takes two weeks to repair and research results are delayed.

*Habits*

*Oral Hygiene*

*Plaque*

After each meal, food debris and bacteria stick to the teeth and form plaque. In the absence of good oral hygiene, plaque becomes tartar.

If you *brush* correctly, only the dice with a value of 4.

If you *floss*, this card cannot cause you any damage.

*Pet*

People share bacteria with their dogs, and canine bacteria interact with the human oral microbiota.

You get a ♦ die, with the same value as the lowest value of the dice you have.

Place the die in one of your black boxes and roll it to determine its initial value.

*Epidemic!*

*Seasonal flu (Influenza virus)*

You are sick with the flu for a few days. The flu weakens your immune system.

You receive 0 for each player next to you with a 0.

If you have *cystic fibrosis*, you also get 

*Epidemic!*

*Bacterial meningitis*

*Neisseria meningitidis* infection. Protection against certain types of bacterial meningitis can only be achieved by completing the recommended vaccination schedule.

Roll 0

Receive 0

*Epidemic!*

*Parotitis*

Viral disease of the salivary glands, also known as mumps. Place the die in one of your black boxes and roll it to determine its initial value.
Receive

Place the die in one of your black boxes and roll it to determine its initial value.

**EPIDEMIC!**
Whooping cough (Bordetella pertussis)

Highly contagious infectious disease of the upper respiratory tract.

**EXTERNAL AGENTS**

Discover Porphyromonas or Veillonella. Roll the dice to find out the initial value. Then, (or vice versa).

**RESEARCH**
New results

Scientists discover that Porphyromonas and Veillonella compete for the same niche and thus hinder the growth of the other species.

**RESEARCH**
New results

Synergy has been observed between Porphyromonas and Gemella.

**DIET**

Aphta

Lack of some vitamins and minerals and food allergies promote the appearance of canker sores.

If you have celiac disease

If not,

**LIFE IS TOUGH**

Also, if you drink sweet beverages,

**ENVIRONMENTAL FACTORS**

Contamination

You live in an area with high pollutant concentration.

**HABITS**

You eat fast food many times a week.

**ENVIRONMENTAL FACTORS**

Damp housing

Your building has severe damp issues, particularly the walls in your bedroom.

**DIET**

Metabolic changes

You eat fast food many times a week.

**LIFE IS TOUGH**

 Also, if you drink sweet beverages,

**DRINKING WATER CHARACTERISTICS**

Fluorine

Fluorine-rich water. Porphyromonas is sensitive to high concentration of fluorine.

If you don’t have it, you discover Porphyromonas. Roll the die to find out its initial value. Then take Porphyromonas

**DRINKING WATER CHARACTERISTICS**

Hardness

Mineral-rich water: decreases Veillonella.

If you don’t have it, you discover Veillonella. Roll the die to find out its initial value. Then decrease Veillonella.
**DRINKING WATER CHARACTERISTICS**

**Chlorine**
- Chlorine-rich water: affects Veillonella.
- If you don’t have it, you discover Veillonella.
- Roll the die to find out its initial value.
- Then move Veillonella

**Alkalinity**
- Very alkaline water inhibits growth of Veillonella and boosts Porphyromonas.
- If you don’t have them, discover Porphyromonas and Veillonella.
- Roll the die to find out their initial values.
- Then Porphyromonas and Veillonella

**LIFE IS TOUGH**

**RESEARCH**

- Study population
- You contact the Down Syndrome Association and collaborate to expand the study population.

**RESEARCH**

- You and another player discover Veillonella or Porphyromonas.
- Roll the die to find out their initial values.
- Put one of your dice at its balance value.

**RESEARCH**

- Study population
- You contact the Cystic Fibrosis Association and collaborate to expand the study population.

**CANVI D’HÀBITS**

- Effets a llarg termini
- Aquesta carta no té cap efecte en aquesta partida... però en la teva pròxima partida, hauràs de jugar amb un personatge de la següent franja d’edat i no podràs repetir carta de característiques.

**HÀBITS**

- Intentar canviar d’hàbits és difícil a curt termini. Els teus esforços es veuran recompensats... però en la partida següent!

**INFECCIÓ**

- Candidiasi
- El fong Candida albicans colonitza la teva boca i estableix una sinergia amb Streptoccocus mutans.

**AGENTES EXTERNOS**

- Pesta negra
- Construeixes una màquina del temps i no se’l faci res millor que anar a 1348, en plena epidèmia de pesta negra. Sembla ser fou causada pel bacteri Yersinia pestis i va provocar la mort d’uns 100 milions de persones a tot el món.

**AGENTES EXTERNOS**

- Reps
- No hi ha vacuna efectiva contra la pesta negra. Les cartes de vacunació no eliminuen aquesta epidèmia.

- Posa el dau en una de les teves caselles negres i llança’t per saber-ne el valor inicial.
ADULT
Mia, female, 43
Streptococcus
4
Prevotella
3
Haemophilus
3
Neisseria
3
Candida (fungus)
3
ADULT
Lydia, female, 45
Streptococcus
4
Prevotella
3
Haemophilus
3
Neisseria
3
Candida (fungus)
3
CHIL
Charlotte, female, 7
Streptococcus
4
Prevotella
2
Haemophilus
3
Neisseria
3
Candida (fungus)
3
TEENAGER
Manaia, female, 16
Streptococcus
4
Prevotella
3
Haemophilus
3
Neisseria
3
Candida (fungus)
2
During contagion, the two neighbour players receive
During contagion, the two neighbour players receive
**TEENAGER**
Noah, male, 17

- **Streptococcus**: 4
- **Prevotella**: 3
- **Haemophilus**: 2
- **Neisseria**: 3
- **Candida (fungus)**: 5

**SENIOR**
William, male, 65

- **Streptococcus**: 5
- **Prevotella**: 3
- **Haemophilus**: 3
- **Neisseria**: 4
- **Candida (fungus)**: 3

**Celiac disease**
Correct tooth brushing

- **Veillonella**: 4
- **Porphyromonas**: 3
- **Gemella**: 3

**Smoker**
Sweet beverages

- **Veillonella**: 4
- **Porphyromonas**: 3

This card **CANNOT** be paired with a child.
This card CANNOT be paired with a child.
Cystic fibrosis

This card CANNOT be paired with a senior.

Veillonella

Porphyromonas

Gemella

Cystic fibrosis

Correct tooth brushing

This card CANNOT be paired with a senior.

Veillonella

Porphyromonas

Gemella

Down syndrome

Correct tooth brushing

This card CANNOT be paired with a senior.

Veillonella

Porphyromonas

Gemella

Down syndrome

Sweet beverages

This card CANNOT be paired with a senior.

Veillonella

Porphyromonas

Gemella