SOFTWARE TOOL FOR IMPLEMENTING THE

FOOD ALLERGY SEVERITY SCORE - FASS

The Food Allergy Severity Score (FASS) is an instrument developed and validated to score the severity of allergic reactions elicited by foods. FASS has three formats that can be mapped to each other consistently: two ordinal scores with 3 (oFASS-3) or 5 grades (oFASS-5), and a numerical score (nFASS). The development and validation are reported in the manuscript of Fernández-Rivas et al. published in Allergy (https://doi.org/10.1111/all.15165).

The software tool presented here has been developed to allow the use of FASS in different data sets of food allergic reactions. This tool can process automatically data files generating the oFASS-3, oFASS-5 and nFASS scores attached as new variables in the data base.

The FASS software tool is designed to score food allergic reactions on the basis of: 1) the organs/systems affected, and 2) the signs/symptoms associated with the organs/systems involved.

Requirements

Windows operating system is required.

User guide

The FASS software tool has been created in Python, but you don't need to install anything external to use it.

The FASS tool reads files written in table format. Symptoms should be encoded in binary variables, 1 if the symptom is present in the reaction, 0 if not. If symptoms are graded in levels of intensity, the data should be converted to binary form beforehand. There is no need to have specific variables indicating which organs are affected. This information is tied to the symptoms and has to be specified to the program as indicated below.

The FASS tool will take an input file that can be in the following formats: .xlsx, .xls, .csv, and will return the following:

- A new file in the original format of the file with three new columns: nFASS, oFASS-5 and oFASS-3 scores.

Tutorial

This simple tutorial clarifies the use of the FASS tool for scoring of allergic reactions.

(1) Encode your dataset correctly

Your dataset must have all the following columns of symptoms. You need all these columns that correspond to the PRACTALL reference symptoms (https://doi.org/10.1016/j.jaci.2012.10.017). If your dataset does not have some of these symptoms you will have a column of zeros, since in no reaction do you have this symptom. The programme will look for these symptoms (and only these) and calculate the score. It is very important that the symptom names are exactly those provided in the table below and that the coding is binary with zeros and ones.

Name of variable	Explanation
itchy_mouth_throat	Itchy mouth/throat
complaints_nausea_or_abdominal_pain	Complaints of nausea OR abdominal pain
frequent_complaints_nausea	Frequent complaints of nausea OR abdominal pain with normal activity
notably_distressed_abd_pain	Notably distressed due to GI symptoms (abdominal pain), with decreased activity
emesis_1	1 episode of emesis
emesis_more_1	>1 episode of emesis
diarrhoea_1	1 episode of diarrhoea
diarrhoea_more_1	>1 episode of diarrhoea
occasional_scrat	Occasional scratching
continuous_scrat	Continuous scratching for >2 min at a time
hard_scrat_excoriations	Hard continuous scratching leading to excoriations
few_erythema	Few areas of faint erythema
erythema_medium	Areas of erythema (≤ 50%)
erythema_generalized	Generalized marked erythema (>50%)
urticaria_less_3	Hives (<3)
urticaria_less_10	Hives (3 to 10)
urticaria_generalized	Generalized involvement (>10)
mid_lip_edema	Mild lip edema
significant_lip_face_edema	Significant lip or face edema
angioedema_generalized	Angioedema generalized
rare_bursts_occasi_sniff	Rare bursts, occasional sniffing
medium_bursts_frequent_sniff	<10 bursts, frequent sniffing OR intermittent rubbing of nose
long_bursts_rhinorrea	Long bursts, persistent rhinorrhea OR continuous rubbing of nose
intermittent_rubbing_eye	Intermittent rubbing of eyes
continuous_rubbing	Continuous rubbing, periocular swelling
expiratory_wheezing	Expiratory wheezing to auscultation
inspiratory_expiratory_wheezing	Inspiratory and expiratory wheezing to auscultation
audible_wheezing	Use of accessory muscles OR audible wheezing
persistent_throat_tightness	Persistent throat tightness/pain
throat_clearing_cough_more_3	>3 episodes of throat clearing OR cough
frequent_cough_hoarseness	Frequent dry cough OR hoarseness
stridor	Stridor

tachycardia	Tachycardia
moderate_drop_BP	Moderate drop BP and/or >20% from baseline
cardiovascular_collapse	Cardiovascular collapse
Weak	Weak, dizzy
change_mental	Significant change in mental status
loss_consciousness	Loss of consciousness

(3) Run Software_FASS.exe

When you run the file, a screen will open with two buttons, one to read the file ("Open file") where you can search for your dataset in the allowed formats and another button ("Generate FASS") to calculate the severity score.
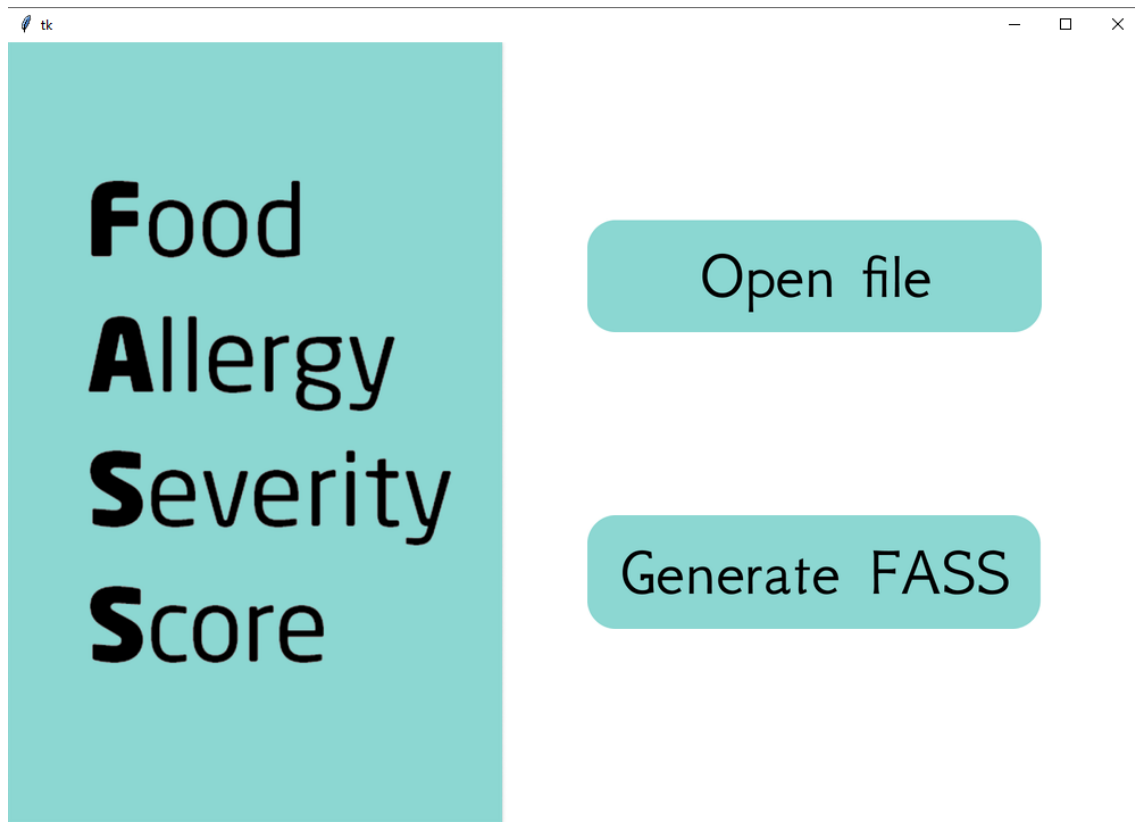
(4) Results of FASS tool

FASS tool will create a new database in the format of the original file in the same folder where you have your dataset. The new file will have the same name as your data file, with an "_FASS" appended to it.

E.g., if your file is named "Foodreactions.xlsx", the output will be "Foodreactions_FASS.xlsx".

Example

FASS tool includes a file for example purposes, "Dataset_example.xlsx".

"Dataset_example.xlsx" include 11 patients. You can see the correct format for your dataset.

	A	B	C	D	E	F
1	patient_no	itchy_mouth_throat	complaints_nausea_or	frequent_complaints_r	notably_distressed_ab	emesis_1
2	1	1	0	0	0	0
3	2	1	0	0	0	1
4	3	1	0	0	1	1
5	4	0	0	1	0	0
6	5	0	0	0	0	0
7	6	1	0	0	0	1
8	7	1	0	0	1	0
9	8	1	0	0	0	0
10	9	1	0	0	0	0
11	10	1	0	0	0	0
12	11	1	0	0	0	0

Extra

Earlier versions of the FASS software are R codes that may be of interest since they can be manipulated by experts. They also include tutorials on how to use them.

Funding