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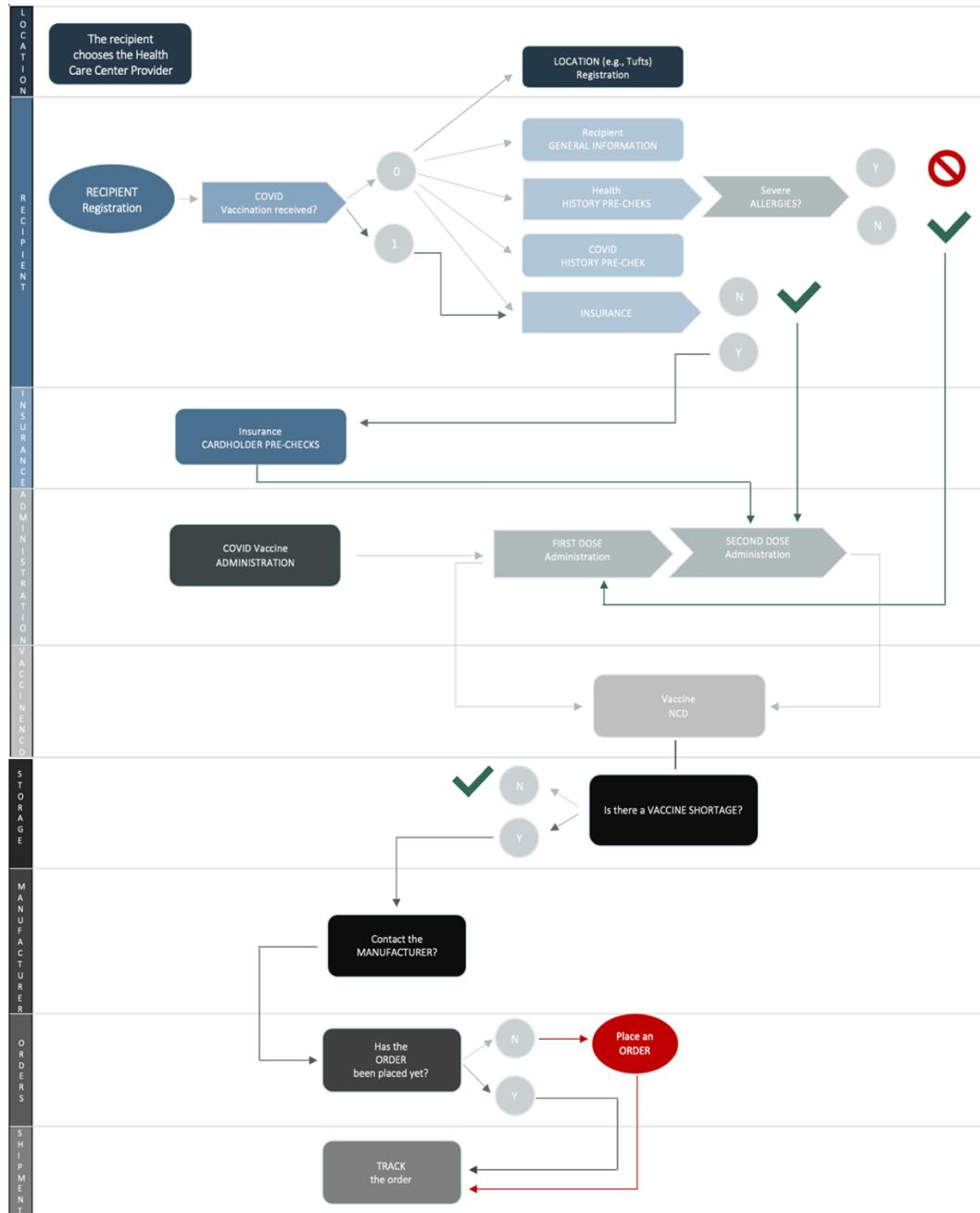
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Data Management & SQL

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Flow of System



The administration of a vaccine in Federally Qualified Health Centers, specifically the COVID vaccine, requires the careful execution of several activities, which challenge the coordination of distinct departments, such as the billing or administration. Therefore, the formulation of a "COVID Vaccination Management System" claims the rigorous analysis of those core activities, which following one another, form the so-called "Flow of System".

As shown in the illustration on the left, the flow starts with the arrival of the recipient at the location, where the COVID shot will be administrated. The registration of the recipient's general information and the location is a necessary step. This will enable the medical staff to screen the patients' medical history to verify if they are suitable to get the injection.

Afterwards, each recipient's health insurance details are stored in the database, right after its validity has been checked. Insurance records are crucial for formulating reports designed for the billing department. Reports might aim to keep track of the percentage of recipients who have or do not have healthcare benefits. A percentage that might be subsequently transferred to the health care insurance providers or the awardee immunity programs supervisors.

Once patient is cleared to receive the vaccine, the COVID vaccine vial is injected by an authorized administrator and then registered under the recipient's name. Important reports can be drawn, for key activities, in the event of the appearance of undesired side-effects to properly classify the batch of origin and understand if recipients vaccinated with vials from the same batch are showing similar symptoms.

Depending on the vaccine provider, the second dose must be appropriately taken such as for Pfizer on the 21st day from the first administration, the second dose must be injected. Keeping track of dates when each first administration took place is vital as it allows the administrative department to schedule recipients' appointments in advance. After verifying the scheduled appointments, the staff can check for any vaccine batch shortage to any avoid delays in processing the second dose. If a storage shortage occurs, the administration department can promptly place an order with CDC or the specific provider. During the shipment, it is important to track each batch to safeguard any delay that might affect the appointments' schedule.

Once the orders have arrived at their destination, each batch will be stored at the correct temperature, indicated by the provider, to guarantee its effectiveness. At this stage, reports regarding the conservation status of the vaccines or their expiration date might be extremely useful in choosing which batch should be administered first among those stored in the storage.

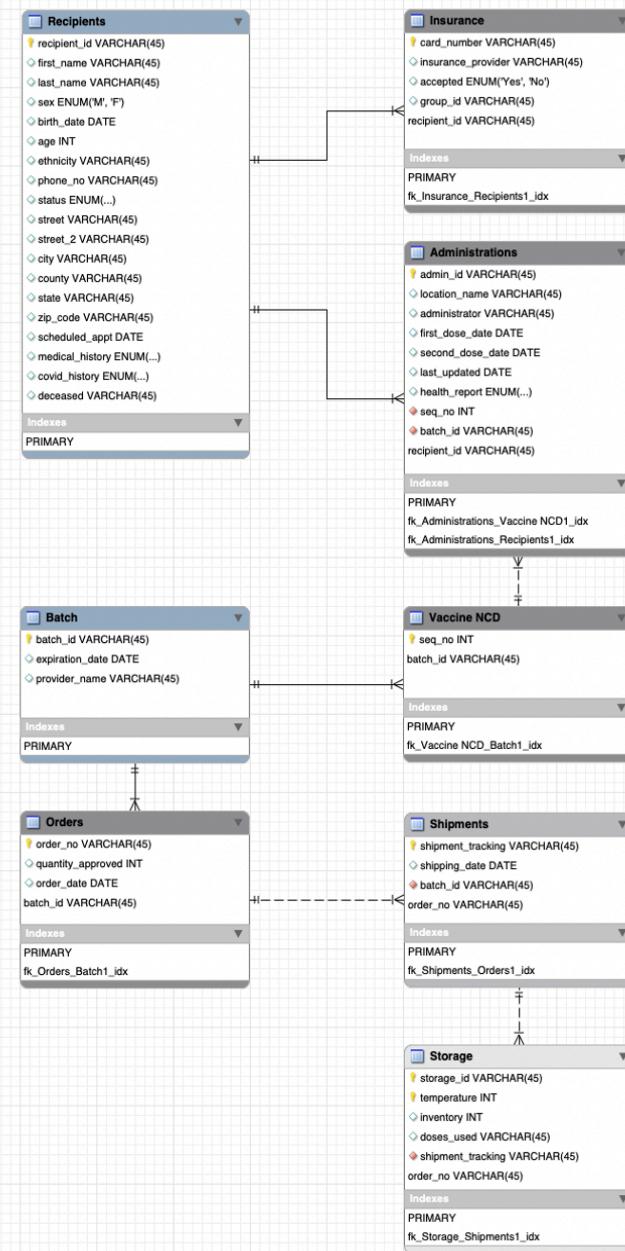
In conclusion, the creation of a "COVID Vaccination Management System" promises to facilitate the execution of activities and decisions, highlighted in the "Flow of System" above.

Explicitly designed to serve Public Health Providers and Federally Qualified Health Centers both to properly manage the recipients' and vaccines information, our "COVID Vaccination Management System" will be beneficial not only for the Health Care Centers but also for those third parties (such as government, vaccine providers or schools), who are interested in monitoring the COVID mass vaccination process. For example, the government might require the Health Care Center to create a report that shows the percentage of daily vaccinations within a specific area of the city or the average age of the fully vaccinated recipients, while schools might ask a report to screen those students fully vaccinated students or those waiting for the second dose at the facility.

Database structure

Table Name	Table Type	Primary Key	Foreign Key	Description
Recipients	Parent	recipient_id		<i>The purpose of the recipients' table is to gather the main information of each patient receiving a COVID vaccine dosage.</i>
Batch	Parent	batch_id		<i>The purpose of the batch's table is to gather the information of each COVID vaccines' batch administrated or stored, produced by any qualified provider.</i>
Insurance	Child	card_number recipient_id	recipient_id	<i>The purpose of the insurance's table is to hold the main recipient's insurance information required by the billing department.</i>
Vaccine NCD	Child	seq_no batch_id	batch_id	<i>The purpose of the vaccine NCD's table is to store the main records of each COVID vaccine' vial administered or stored.</i>
Administrations	Child	admin_id recipient_id	recipient_id batch_id seq_no	<i>The purpose of the administrations table is to collect all the patient's COVID vaccine administration details. In this way, in the remote case of the rise of unwanted side-effects, it will be immediately possible to identify the origin of the vaccine administered to the recipient for the purpose of verification and investigation.</i>
Orders	Child	order_no batch_id	batch_id	<i>The purpose of the order's table is to hold the records of each vaccine batch ordered.</i>
Shipments	Child	shipment_tracking order_no	order_no batch_id	<i>The purpose of the shipments' table is to hold the main shipment information of each vaccine batch ordered.</i>
Storage	Child	storage_id temperature order_no	shipment_tracking order_no	<i>The purpose of the storage table is to promptly locate where each vaccine batch ordered has been stored and at which temperature it has to be preserved. Moreover, records have also been stored to keep track of the vaccine doses administrated and those left in the inventory.</i>

Entity-Relational (ER) Model



1. Create a report to show the percentage of the recipients covered by an accepted health care insurance plan and the percentage of those who are not (billing purposes).

The following report might be demanded by the billing department, whose director wishes to check that each hospital service has been properly charged to each insurance provider. This data might also be provided to the finance department for the creation of any audit report.

Following the SQL query displays recipients' insurance details to highlight who has an active insurance and which is the provider:

```
SELECT recipients.recipient_id AS "Recipient_Id", recipients.first_name AS "First Name", recipients.last_name AS "Last Name", insurance.card_number
AS "Card Number", insurance.insurance_provider AS "Insurance Provider"
FROM recipients
LEFT JOIN insurance ON recipients.recipient_id = insurance.recipient_id
ORDER BY recipients.first_name, recipients.last_name;
```

Follow the result set:

Recipient_Id		Resets all sorted columns	Number	Insurance Provider
399I	Alexander	Miller	NPH0058499485	My Care Family
121A	Jack	Alonso	NULL	NULL
603F	Jenny	Doe	NPH0000032455	My Care Family
839H	Josephine	Shane	XXA8800628264	Health Partners
395E	Madison	Carter	XYZ12435098234	Mass Blue Cross
572G	Mark	Black	MTN0000672643	Mass Blue Cross
310L	Mary	Lane	NPH0000473847	My Care Family
323C	Sophia	Long	MTN1238792234	Mass Blue Cross
123B	William	Hughes	XXA8800100164	Health Partners
384D	Xabi	Perry	MTN0983234560	Mass Blue Cross

2. Creation of a report that shows how many COVID vaccine doses are administered daily. How many first and second doses have been administered?

Both COVID vaccine providers require 2 doses to offer the full vaccine benefits and according to the scientists the first dose only helps with the immune system creates a response and the 2nd dose will further boost the response for long-term protection. The Nurse Manager wants to make sure the vaccines are being administrated daily to meet the government requirements. As well as needs to know how many appointments are scheduled to assign a shift to the team.

Following the SQL query used to create a report that shows the number of first doses administrated:

```
SELECT count(1) as "Number of First Doses Administrated", first_dose_date as "First Administration Date"  
FROM administrations  
WHERE first_dose_date IS NOT NULL  
GROUP BY first_dose_date  
ORDER BY count(1) DESC;
```

Follow the result set:

Number of First Doses Administrated	First Administration Date
2	2021-01-18
1	2021-01-27
1	2021-01-26

Following the SQL query used to create a report that shows the number of first doses administrated:

```
SELECT count(1) as "Second Doses Administrated", second_dose_date as "Second Administration Date"  
FROM administrations  
WHERE second_dose_date IS NOT NULL  
GROUP BY second_dose_date  
ORDER BY count(1) DESC;
```

Follow the result set:

Number of Second Doses Administrated	Second Administration Date
3	2020-12-18
2	2020-12-24
2	2021-01-18
1	2021-01-19
1	2021-01-21
1	2021-01-20

3. Creation of a report that shows all those recipients who are waiting for the administration of the 2nd dose. When are they scheduled for the 2nd shot? How many days are left from 2nd dose appointment?

This report is for ordering purposes and for the admin manager overseeing the vaccination appointments to guarantee all patients are being vaccinated. Especially, to **confirm** that all recipients waiting for the 2nd dose are prioritized to receive the full vaccine benefits, following the vaccine providers' indications. For example, once all the appointments have been scheduled, the number of recipients booked for the following days can be compared with the number of doses left in the storage. In case of a vaccine shortage, an order will be placed by the administration department to avoid potential delays.

Following the SQL query used to create the report:

```
SELECT recipient_id as "Recipient Id", first_name as "First Name", last_name as "Last Name", scheduled_appt as "Scheduled Appointment",
datediff(date(now()), scheduled_appt) as Days_Remaining
FROM recipients
WHERE scheduled_appt IS NOT NULL
AND scheduled_appt IN (SELECT scheduled_appt
          FROM recipients
          WHERE scheduled_appt > date(now())))
ORDER BY Days_Remaining ASC;
```

Follow the result set:

Recipient Id	First Name	Last Name	Scheduled Appointm...	Days_Remaining
399I	Alexander	Miller	2021-02-18	-18
572G	Mark	Black	2021-02-18	-18
839H	Josephine	Shane	2021-02-18	-18
310L	Mary	Lane	2021-02-17	-17

4. Creation of a report that shows how many vaccine providers are supplying the Federally Qualified Health Center. Show how many vaccine doses are left in the inventory. When will it be necessary to place a new order from one of the providers?

The COVID vaccines will be overseen by a centralized system and ordered through CDC. To avoid any vaccine shortage and to allow a proper storage administration, the inventory manager will need a detailed report of each storage unit.

Following the SQL query used to create the report that shows how many providers are supplying the facility:

```
SELECT count(distinct provider_name) as "Number of Vaccines' Providers"  
FROM batch;
```

Follow the result set:

Number of Vaccines' Providers
3

Following the SQL query used to show how many are left in the inventory group by the vaccine provider:

```
SELECT batch.provider_name as "Vaccine Provider Name", storage.doses_used as "Doses Administrated", storage.inventory as "Doses Left"  
FROM batch, orders, storage  
WHERE batch.batch_id = orders.batch_id  
AND orders.order_no = storage.order_no  
ORDER BY storage.doses_used DESC;
```

Follow the result set:

Vaccine Provider Name	Doses Administrated	Doses Left
Moderna	9	1
Pfizer- BioNTech	7	8
Moderna	17	3
AstraZeneca	1	49

Since inventory will be periodically checked and it might be time-consuming, creating a view will speed up this procedure. Below the code used to create the view:

```
CREATE VIEW storage_overview AS  
SELECT batch.provider_name AS "Vaccine Provider Name", storage.doses_used AS "Doses Administrated", storage.inventory AS "Doses Left"  
FROM batch, orders, storage  
WHERE batch.batch_id = orders.batch_id  
AND orders.order_no = storage.order_no  
ORDER BY storage.doses_used DESC;
```

Once the view is created, the inventory manager will just need use the latter to pull up the bi-weekly or monthly reports for the storage without going into any hassle.

```
SELECT *  
FROM storage_overview;
```

Follow the result set:

Vaccine Provider Name	Doses Administrated	Doses Left
Moderna	9	1
Pfizer- BioNTech	7	8
Moderna	17	3
AstraZeneca	1	49

5. Creation of a report that shows any recipient that has experienced side-effects after the 1st dose or the 2nd dose by provider name.

175 case reports were identified for further review as possible cases of severe allergic reaction, including anaphylaxis. "Anaphylaxis is a life-threatening allergic reaction that does occur rarely after vaccination, with onset typically within minutes to hours (3)." In 71% of the cases, this symptom occurred within 15 minutes of being vaccinated.

Ordinarily, recipients or health care facilities report any experienced side-effect to Vaccine Adverse Event Reporting System (VAERS).

The present report might be useful to any vaccine administrator eager to identify which side effects might occur to be prepared to handle them right away. Common side effects include pain, redness, soreness, tiredness, fever, and headache.

Following the SQL query used to create the report:

```
SELECT recipient_id as "Recipient Id", health_report as "Experienced Side-Effects", first_dose_date as "First Administration Date", second_dose_date as "Second Administration Date"  
FROM administrations  
WHERE health_report != "Nothing"  
ORDER BY first_dose_date, second_dose_date DESC;
```

Follow the result set:

Recipient Id	Experienced Side-Effects	First Administration Date	Second Administration Date
121A	Soreness	NULL	2021-01-19
839H	Fever	NULL	2021-01-18
395E	Soreness	NULL	2020-12-24
384D	Severe Allergies	NULL	2020-12-18
123B	Other	2020-12-18	NULL
572G	Allergies	2021-01-18	NULL
839H	Severe Allergies	2021-01-18	NULL

6. Create a report of side effects based on the vaccine administrated?

Creation of a report that shows any recipients that has experienced severe COVID after the first dose or the second dose.

This report is for the provider to monitor the effectiveness of the vaccine. Is it still likely that patients still contract severe COVID symptoms after having received the 1 or 2 doses of the vaccine? According to a report sent out the last week of December, 21 cases of anaphylaxis have been reported after the administration of the Pfizer-BioNTech COVID-19 vaccines. It is important to know which provider's vaccine gave the side effect to monitor the efficacy and effects of the vaccine to the individuals health. This report will also benefit any Vaccine Research Center to advance the investigation of the virus and the Government to manage the pandemic with the new board in the seat.

Following the SQL query used to create the report:

```
SELECT batch.provider_name AS "Provider Name", administrations.health_report AS "Experienced Side-Effects"  
FROM recipients, administrations, batch  
WHERE recipients.recipient_id = administrations.recipient_id  
AND administrations.batch_id = batch.batch_id  
AND recipients.status IN ("Vaccinated", "Fully Vaccinated")  
ORDER BY batch.provider_name, administrations.health_report ASC;
```

Follow the result set:

Provider Name	Experienced Side-Effects
AstraZeneca	Nothing
Moderna	Allergies
Moderna	Severe Allergies
Moderna	Fever
Moderna	Soreness
Moderna	Soreness
Moderna	Nothing
Pfizer- BioNTech	Severe Allergies
Pfizer- BioNTech	Other
Pfizer- BioNTech	Nothing

7. Create a report that shows any death that has happened after being fully vaccinated and where COVID has been diagnosed. Which COVID vaccine did they receive?

Authorities are investigating the deaths of people due to COVID even after being vaccinated. Therefore, the District officials need a report from any Health Care Center of all the deceased patients and which vaccine they received. This report might help any COVID research center monitor not only the vaccine efficiency but also the virus response to treatment.

Following the SQL query used to create the report:

```
SELECT recipients.recipient_id AS "Recipient Id", recipients.deceased AS "Deceased after Vaccinationed", batch.provider_name AS "Vaccine Provider"  
FROM recipients, administrations, batch  
WHERE recipients.recipient_id = administrations.recipient_id  
AND administrations.batch_id = batch.batch_id  
AND status = "Fully Vaccinated"  
AND deceased = "Yes";
```

Follow the set:

Recipient Id	Deceased after Vaccinationed	Vaccine Provider
384D	Yes	Pfizer- BioNTech

8. Creation of a report that shows how many recipients have been fully vaccinated. The report has to display the number of males, females, and their ethnicity.

After the FDA approves the vaccine, they continue to oversee the administration and safety. This report is for CDC to know how many vaccines have been given to the public.

Following the SQL query used to create the report:

```
SELECT count(1) as "Recipients Count", sex as "Gender", ethnicity as "Ethnicity"  
FROM recipients  
WHERE status = "Fully Vaccinated"  
GROUP BY sex, ethnicity  
ORDER BY sex, ethnicity DESC;
```

Follow the result set:

Recipients Count	Gender	Ethnicity
2	M	White
1	M	Asian
1	F	Native American
1	F	Black
1	F	Asian

9. Creation of a report that shows how many recipients have been vaccinated in Middlesex county.

The district officials might want to know how many recipients have been fully vaccinated in their county and ask each health care facility to produce a report. The latter could also help each state monitoring the advancement of the COVID mass vaccination with the primary goal of having all the citizens of age 65 and above vaccinated in the next couple of months.

Following the SQL query used to create the report:

```
SELECT recipient_id as "Recipient Id", age as "Recipient Age", status as "Recipient Status", county as "County"  
FROM recipients  
WHERE status = "Fully Vaccinated"  
AND county = "Middlesex";
```

Follow the result set:

Recipient Id	Recipient Age	Recipient Status	County
121A	72	Fully Vaccinated	Middlesex
323C	51	Fully Vaccinated	Middlesex
395E	37	Fully Vaccinated	Middlesex
603F	37	Fully Vaccinated	Middlesex

10. Is the Health Care Center in line with the vaccine administration state regulations? Are people over 65 being vaccinated? If not, there is any reason in the recipient's medical history.

Following the SQL query used to create the report:

```
SELECT round(std(age),2) as "Age Standard Deviation", round(avg(age), 0) as "Average Age", sex as "Recipient Gender"  
FROM recipients  
GROUP BY sex;
```

Follow the result set:

Age Standard Deviation	Average Age	Recipient Gender
21.72	60	M
20.88	58	F

On average, the male recipients have an age of 60 years old, while female recipients an age of 58. However, the standard deviation seems to show some data points far away from the average, highlighting the presence of potential outliers. In the case of outliers, might be useful the creation of a report that shows the medical history of the recipient to investigate the reason for the vaccine administration.

Following the SQL query used to create the report:

```
SELECT recipient_id as "Recipient Id", age as "Recipient Age", sex as "Recipient Gender", medical_history as "Recipient Medical History"  
FROM recipients  
WHERE age < 60  
ORDER BY age ASC;
```

Follow the result set:

Recipient Id	Recipient Age	Recipient Gender	Recipient Medical History
123B	27	M	None
395E	37	F	Allergies
603F	37	F	Allergies
384D	42	M	Heart Problems
323C	51	F	Others

Store Procedures

First Store Procedure

- **Input:** *None*
- **Functionality:** Update all the past scheduled appointments to NULL since all the patients that had an appointment for their 2nd dose (e.g. either 1 month after or 21 days after) have been fully vaccinated. This is also because the administration table already has the actual date of each vaccination 1st and 2nd dose. This will allow doctors and other staff to know what's on the plate for the upcoming days and can prepare ahead of time. (Scheduled appointment – DONE/FULLY VACCINATED > drop/null > Scheduled_appt)
- **Output:** *None*

Following the SQL query used to create first store procedure:

```
CREATE PROCEDURE `scheduled_admin_appt_proc`()
```

```
BEGIN
DECLARE v_recipient varchar(45);

DECLARE cur1 CURSOR FOR
SELECT recipient_id
FROM recipients
WHERE scheduled_appt IS NOT NULL
AND scheduled_appt < date(now());

OPEN cur1;
    a1: LOOP
        FETCH cur1 INTO v_recipient;
        UPDATE recipients
        SET scheduled_appt = NULL
        WHERE recipient_id = v_recipient;
```

END LOOP a1;

END

Follow the result set of the store procedure:

recipient_id	first_name	last_name	sex	birth_date	age	ethnicity	phone_no	status	street	street_2	city	county	state	zip_code	scheduled_appt	medical_history	covid_history	deceased
121A	Jack	Alonso	M	1949-03-14	72	White	6175801210	Fully Vaccinated	555 Fulton St.	NULL	Medford	Middlesex	MA	2155	NULL	None	No	No
123B	William	Hughes	M	1994-05-28	27	White	8572349876	Fully Vaccinated	601 W Main St.	NULL	Boston	Suffolk	MA	2472	NULL	None	No	No
310L	Mary	Lane	F	1947-08-07	73	Native American	6173890292	Vaccinated	22 Water St.	NULL	Cambridge	Middlesex	MA	2141	2021-02-17	Diabetes	NA	No
323C	Sophia	Long	F	1970-06-02	51	Black	6172344567	Fully Vaccinated	420 Pacific Ave.	NULL	Everett	Middlesex	MA	98201	NULL	Others	NA	No
384D	Xabi	Perry	M	1979-04-03	42	Asian	6172340987	Fully Vaccinated	1075 W. Branch	NULL	Boston	Suffolk	MA	2129	NULL	Heart Problems	Yes	Yes
395E	Madison	Carter	F	1984-01-01	37	Native American	8575807483	Fully Vaccinated	11 Willie Ave.	NULL	Cambridge	Middlesex	MA	2155	NULL	Allergies	Yes	No
399I	Alexander	Miller	M	1945-06-19	75	Native American	8575262637	Vaccinated	16 Everett St.	NULL	Boston	Suffolk	MA	2128	2021-02-18	Others	Yes	No
572G	Mark	Black	M	1936-03-24	84	Black	6170320248	Vaccinated	85 Whitford St.	NULL	Cambridge	Middlesex	MA	2131	2021-02-18	Severe Allergies	Yes	No
603F	Jenny	Doe	F	1984-03-02	37	Asian	6179908475	Fully Vaccinated	234 Musuem Way	NULL	Cambridge	Middlesex	MA	2141	NULL	Allergies	NA	No
839H	Josephine	Shane	F	1931-01-05	90	White	6179375620	Vaccinated	54 Winter St.	NULL	Quincy	Norfolk	MA	2169	2021-02-18	Heart Problems	Yes	No

Second Store Procedure

- **Input:** What manufacturer does the manager need to order the vaccines from? Quickly check each provider's inventory in the storage for covid vaccines.
- **Functionality:** The inventory manager keeps track of all vaccines placed in the storage and handles all the ordering when necessary. For example, if the Nurse says that there are only 10 "Pfizer- BioNTech" vaccines left. The staff will be able to double check with the inventory used > inventory left and see whether that is correct (since the database will have all the backlogs).
- **Output:** After inputting the provider name, based on the threshold of 20 Covid vaccine let the manager know if an order needs to be place. Once the inventory reaches below the threshold it becomes urgent to order vaccines from the proper manufacturer since it will delay any vaccinations for the next week due to shortage.

Following the SQL query used to create the report:

```
CREATE PROCEDURE `ordering_proc_1`(IN in_prov_name varchar(45), OUT out_order_yn varchar(45), OUT out_prov_name varchar(45))
BEGIN

DECLARE order_check varchar(45);

SELECT s.inventory
INTO order_check
FROM storage s
LEFT JOIN orders
ON orders.order_no = s.order_no
INNER JOIN batch
ON batch.batch_id = orders.batch_id
WHERE batch.provider_name = in_prov_name;

IF order_check <= 20
    THEN SET out_order_yn = "Place an Order";
ELSE
```

```
    SET out_order_yn = "Don't Order";
END IF;
    SET out_prov_name = in_prov_name;

END
```

Follow the result sets of the store procedure.

@out_name	@in_out
Place an Order	Pfizer- BioNTech
@out_name	@in_out
Don't Order	AstraZeneca
@out_name	@in_out
Place an Order	Moderna

References

CDC, (December 2020). *Allergic Reactions Including Anaphylaxis After Receipt of the First Dose of Pfizer-BioNTech COVID-19 Vaccine.*

Retrieved from: <https://www.cdc.gov/mmwr/volumes/70/wr/mm7002e1.htm>

Appendix

Database Forward Engineering

```
-- MySQL Workbench Forward Engineering

SET @OLD_UNIQUE_CHECKS=@@UNIQUE_CHECKS, UNIQUE_CHECKS=0;
SET @OLD_FOREIGN_KEY_CHECKS=@@FOREIGN_KEY_CHECKS, FOREIGN_KEY_CHECKS=0;
SET @OLD_SQL_MODE=@@SQL_MODE,
SQL_MODE='ONLY_FULL_GROUP_BY,STRICT_TRANS_TABLES,NO_ZERO_IN_DATE,NO_ZERO_DATE,ERROR_FOR_DIVISION_BY_ZERO,NO_ENGINE_SUBSTITUTION';

-----
-- Schema mydb
-----

-----
-- Schema Covid_Management_Vaccination_System
-----
```

-- Schema Covid_Management_Vaccination_System

```
CREATE SCHEMA IF NOT EXISTS `Covid_Management_Vaccination_System` DEFAULT CHARACTER SET utf8 ;  
USE `Covid_Management_Vaccination_System` ;
```

```
-- Table `Covid_Management_Vaccination_System`.`Batch`
```

```
CREATE TABLE IF NOT EXISTS `Covid_Management_Vaccination_System`.`Batch` (  
`batch_id` VARCHAR(45) NOT NULL,  
`expiration_date` DATE NULL DEFAULT NULL,  
`provider_name` VARCHAR(45) NULL DEFAULT NULL,  
PRIMARY KEY (`batch_id`))  
ENGINE = InnoDB  
DEFAULT CHARACTER SET = utf8;
```

```
-- Table `Covid_Management_Vaccination_System`.`Vaccine NCD`
```

```
CREATE TABLE IF NOT EXISTS `Covid_Management_Vaccination_System`.`Vaccine NCD` (  
`seq_no` INT NOT NULL,  
`batch_id` VARCHAR(45) NOT NULL,  
PRIMARY KEY (`seq_no`, `batch_id`),  
INDEX `fk_Vaccine NCD_Batch1_idx` (`batch_id` ASC) VISIBLE,  
CONSTRAINT `fk_Vaccine NCD_Batch1`  
FOREIGN KEY (`batch_id`)  
REFERENCES `Covid_Management_Vaccination_System`.`Batch` (`batch_id`))
```

```
ENGINE = InnoDB
```

```
DEFAULT CHARACTER SET = utf8;
```

```
-- Table `Covid_Management_Vaccination_System`.`Recipients`
```

```
CREATE TABLE IF NOT EXISTS `Covid_Management_Vaccination_System`.`Recipients` (
  `recipient_id` VARCHAR(45) NOT NULL,
  `first_name` VARCHAR(45) NULL DEFAULT NULL,
  `last_name` VARCHAR(45) NULL DEFAULT NULL,
  `sex` ENUM('M', 'F') NULL DEFAULT NULL,
  `birth_date` DATE NULL DEFAULT NULL,
  `age` INT NULL DEFAULT NULL,
  `ethnicity` VARCHAR(45) NULL DEFAULT NULL,
  `phone_no` VARCHAR(45) NULL DEFAULT NULL,
  `status` ENUM('Vaccinated', 'Fully Vaccinated') NULL DEFAULT NULL,
  `street` VARCHAR(45) NULL DEFAULT NULL,
  `street_2` VARCHAR(45) NULL DEFAULT NULL,
  `city` VARCHAR(45) NULL DEFAULT NULL,
  `county` VARCHAR(45) NULL DEFAULT NULL,
  `state` VARCHAR(45) NULL DEFAULT NULL,
  `zip_code` VARCHAR(45) NULL DEFAULT NULL,
  `scheduled_appt` DATE NULL DEFAULT NULL,
  `medical_history` ENUM('Heart Problems', 'Allergies', 'Severe Allergies', 'Cancer', 'Diabetes', 'None', 'Others') NULL DEFAULT NULL,
  `covid_history` ENUM('Yes', 'No', 'NA') NULL DEFAULT NULL,
```

```
`deceased` VARCHAR(45) NULL DEFAULT NULL,  
PRIMARY KEY (`recipient_id`))  
ENGINE = InnoDB  
DEFAULT CHARACTER SET = utf8;
```

```
-- Table `Covid_Management_Vaccination_System`.`Administrations`
```

```
CREATE TABLE IF NOT EXISTS `Covid_Management_Vaccination_System`.`Administrations` (  
`admin_id` VARCHAR(45) NOT NULL,  
`location_name` VARCHAR(45) NULL DEFAULT NULL,  
`administrator` VARCHAR(45) NULL DEFAULT NULL,  
`first_dose_date` DATE NULL DEFAULT NULL,  
`second_dose_date` DATE NULL DEFAULT NULL,  
`last_updated` DATE NULL DEFAULT NULL,  
`health_report` ENUM('Heart Problem', 'Allergies', 'Severe Allergies', 'Fever', 'Soreness', 'COVID', 'Other', 'Nothing') NULL DEFAULT NULL,  
`seq_no` INT NOT NULL,  
`batch_id` VARCHAR(45) NOT NULL,  
`recipient_id` VARCHAR(45) NOT NULL,  
PRIMARY KEY (`admin_id`, `recipient_id`),  
INDEX `fk_Administrations_Vaccine NCD1_idx` (`seq_no` ASC, `batch_id` ASC) VISIBLE,  
INDEX `fk_Administrations_Recipients1_idx` (`recipient_id` ASC) VISIBLE,  
CONSTRAINT `fk_Administrations_Vaccine NCD1`  
FOREIGN KEY (`seq_no` , `batch_id`)  
REFERENCES `Covid_Management_Vaccination_System`.`Vaccine NCD` (`seq_no` , `batch_id`),
```

```
CONSTRAINT `fk_Administrations_Recipients1`
FOREIGN KEY (`recipient_id`)
REFERENCES `Covid_Management_Vaccination_System`.`Recipients`(`recipient_id`)
ON DELETE NO ACTION
ON UPDATE NO ACTION)
ENGINE = InnoDB
DEFAULT CHARACTER SET = utf8;
```

```
-- Table `Covid_Management_Vaccination_System`.`Insurance`
```

```
CREATE TABLE IF NOT EXISTS `Covid_Management_Vaccination_System`.`Insurance` (
`card_number` VARCHAR(45) NOT NULL,
`insurance_provider` VARCHAR(45) NULL DEFAULT NULL,
`accepted` ENUM('Yes', 'No') NULL DEFAULT NULL,
`group_id` VARCHAR(45) NULL DEFAULT NULL,
`recipient_id` VARCHAR(45) NOT NULL,
PRIMARY KEY (`card_number`, `recipient_id`),
INDEX `fk_Insurance_Recipients1_idx` (`recipient_id` ASC) VISIBLE,
CONSTRAINT `fk_Insurance_Recipients1`
FOREIGN KEY (`recipient_id`)
REFERENCES `Covid_Management_Vaccination_System`.`Recipients`(`recipient_id`)
ON DELETE NO ACTION
ON UPDATE NO ACTION)
ENGINE = InnoDB
```

```
DEFAULT CHARACTER SET = utf8;
```

```
-- Table `Covid_Management_Vaccination_System`.`Orders`
```

```
CREATE TABLE IF NOT EXISTS `Covid_Management_Vaccination_System`.`Orders` (
  `order_no` VARCHAR(45) NOT NULL,
  `quantity_approved` INT NULL DEFAULT NULL,
  `order_date` DATE NULL DEFAULT NULL,
  `batch_id` VARCHAR(45) NOT NULL,
  PRIMARY KEY (`order_no`, `batch_id`),
  INDEX `fk_Orders_Batch1_idx` (`batch_id` ASC) VISIBLE,
  CONSTRAINT `fk_Orders_Batch1`
    FOREIGN KEY (`batch_id`)
    REFERENCES `Covid_Management_Vaccination_System`.`Batch` (`batch_id`)
```

```
ENGINE = InnoDB
```

```
DEFAULT CHARACTER SET = utf8;
```

```
-- Table `Covid_Management_Vaccination_System`.`Shipments`
```

```
CREATE TABLE IF NOT EXISTS `Covid_Management_Vaccination_System`.`Shipments` (
  `shipment_tracking` VARCHAR(45) NOT NULL,
  `shipping_date` DATE NULL DEFAULT NULL,
```

```
'batch_id` VARCHAR(45) NOT NULL,  
'order_no` VARCHAR(45) NOT NULL,  
PRIMARY KEY (`shipment_tracking`, `order_no`),  
INDEX `fk_Shipments_Orders1_idx` (`order_no` ASC, `batch_id` ASC) VISIBLE,  
CONSTRAINT `fk_Shipments_Orders1`  
    FOREIGN KEY (`order_no` , `batch_id`)  
        REFERENCES `Covid_Management_Vaccination_System`.`Orders` (`order_no` , `batch_id`))  
ENGINE = InnoDB  
DEFAULT CHARACTER SET = utf8;
```

```
-- Table `Covid_Management_Vaccination_System`.`Storage`
```

```
CREATE TABLE IF NOT EXISTS `Covid_Management_Vaccination_System`.`Storage` (  
`storage_id` VARCHAR(45) NOT NULL,  
`temperature` INT NOT NULL,  
`inventory` INT NULL DEFAULT NULL,  
`doses_used` VARCHAR(45) NULL DEFAULT NULL,  
`shipment_tracking` VARCHAR(45) NOT NULL,  
`order_no` VARCHAR(45) NOT NULL,  
PRIMARY KEY (`storage_id` , `temperature` , `order_no`),  
INDEX `fk_Storage_Shipments1_idx` (`shipment_tracking` ASC, `order_no` ASC) VISIBLE,  
CONSTRAINT `fk_Storage_Shipments1`  
    FOREIGN KEY (`shipment_tracking` , `order_no`)  
        REFERENCES `Covid_Management_Vaccination_System`.`Shipments` (`shipment_tracking` , `order_no`))
```

```
ENGINE = InnoDB
```

```
DEFAULT CHARACTER SET = utf8;
```

```
SET SQL_MODE=@OLD_SQL_MODE;
```

```
SET FOREIGN_KEY_CHECKS=@OLD_FOREIGN_KEY_CHECKS;
```

```
SET UNIQUE_CHECKS=@OLD_UNIQUE_CHECKS;
```

Tables Import

Recipients

```
LOCK TABLES `Recipients` WRITE;
/*!40000 ALTER TABLE `Recipients` DISABLE KEYS */;
INSERT INTO `Recipients` VALUES ('121A','Jack','Alonso','M','1949-03-14',72,'White','6175801210','Fully Vaccinated','555 Fulton St.',NULL,'Medford','Middlesex','MA','2155',NULL,'None','No','No'),('123B','William','Hughes','M','1994-05-28',27,'White','8572349876','Fully Vaccinated','601 W Main St.',NULL,'Boston','Suffolk','MA','2472',NULL,'None','No','No'),('310L','Mary','Lane','F','1947-08-07',73,'Native American','6173890292','Vaccinated','22 Water St.',NULL,'Cambridge','Middlesex','MA','2141','2021-02-17','Diabetes','NA','No'),('323C','Sophia','Long','F','1970-06-02',51,'Black','6172344567','Fully Vaccinated','420 Pacific Ave.',NULL,'Everett','Middlesex','MA','98201',NULL,'Others','NA','No'),('384D','Xabi','Perry','M','1979-04-03',42,'Asian','6172340987','Fully Vaccinated','1075 W. Branch',NULL,'Boston','Suffolk','MA','2129',NULL,'Heart Problems','Yes','Yes'),('395E','Madison','Carter','F','1984-01-01',37,'Native American','8575807483','Fully Vaccinated','11 Willie Ave.',NULL,'Cambridge','Middlesex','MA','2155',NULL,'Allergies','Yes','No'),('399I','Alexander','Miller','M','1945-06-19',75,'Native American','8575262637','Vaccinated','16 Everett St.',NULL,'Boston','Suffolk','MA','2128','2021-02-18','Others','Yes','No'),('572G','Mark','Black','M','1936-03-24',84,'Black','6170320248','Vaccinated','85 Whitford St.',NULL,'Cambridge','Middlesex','MA','2131','2021-02-18','Severe Allergies','Yes','No'),('603F','Jenny','Doe','F','1984-03-02',37,'Asian','6179908475','Fully Vaccinated','234 Musuem Way',NULL,'Cambridge','Middlesex','MA','2141',NULL,'Allergies','NA','No'),('839H','Josephine','Shane','F','1931-01-05',90,'White','6179375620','Vaccinated','54 Winter St.',NULL,'Quincy','Norfolk','MA','2169','2021-02-18','Heart Problems','Yes','No');
/*!40000 ALTER TABLE `Recipients` ENABLE KEYS */;
UNLOCK TABLES;
/*!40103 SET TIME_ZONE=@OLD_TIME_ZONE */;
```

Insurance

```
LOCK TABLES `Insurance` WRITE;
```

```

/*!40000 ALTER TABLE `Insurance` DISABLE KEYS */;
INSERT INTO `Insurance` VALUES ('123B','XXA8800100164','Health Partners','Yes','1'),('310L','NPH0000473847','My Care Family','Yes','PPO'),('323C','MTN1238792234','Mass Blue Cross','Yes','MASA'),('384D','MTN0983234560','Mass Blue Cross','Yes','MASA'),('395E','XYZ12435098234','Mass Blue Cross','Yes','MASA'),('399I','NPH0058499485','My Care Family','Yes','PPO'),('572G','MTN0000672643','Mass Blue Cross','Yes','Medicare'),('603F','NPH0000032455','My Care Family','Yes','ADV'),('839H','XXA8800628264','Health Partners','Yes','Medicare');

/*!40000 ALTER TABLE `Insurance` ENABLE KEYS */;

UNLOCK TABLES;

/*!40103 SET TIME_ZONE=@OLD_TIME_ZONE */;
```

Administrations

```

LOCK TABLES `Administrations` WRITE;

/*!40000 ALTER TABLE `Administrations` DISABLE KEYS */;

INSERT INTO `Administrations` VALUES ('121A','AJ099','Tuft Medical Center','Sall','2020-12-18',NULL,NULL,'Nothing',1,'480'),('121A','LJ118','Tuft Medical Center','Julie',NULL,'2021-01-19',NULL,'Soreness',10,'190'),('123B','FJ111','Tuft Medical Center','Sall',NULL,'2020-12-18',NULL,'Nothing',5,'220'),('123B','ZJ100','Tuft Medical Center','Julie','2020-12-18',NULL,NULL,'Other',1,'220'),('310L','QJ110','Tuft Medical Center','Sall','2021-01-27',NULL,NULL,'Nothing',4,'220'),('310L','WJ120','Tuft Medical Center','Sall',NULL,'2021-01-21',NULL,'Nothing',12,'190'),('323C','BJ102','Tuft Medical Center','Julie','2020-12-18',NULL,NULL,'Nothing',2,'220'),('323C','OJ112','Tuft Medical Center','Sall',NULL,'2020-12-18',NULL,'Nothing',6,'220'),('384D','GJ113','Tuft Medical Center','Sall',NULL,'2020-12-18',NULL,'Severe Allergies',7,'220'),('384D','TJ103','Tuft Medical Center','Sall','2020-12-18',NULL,NULL,'Nothing',3,'220'),('395E','CJ104','Tuft Medical Center','Bob','2020-12-24',NULL,NULL,'Nothing',1,'190'),('395E','NJ114','Tuft Medical Center','Julie',NULL,'2020-12-24',NULL,'Soreness',6,'190'),('399I','EJ108','Tuft Medical Center','Bob','2021-01-26',NULL,NULL,'Nothing',5,'190'),('399I','XJ119','Tuft Medical Center','Sall',NULL,'2021-01-20',NULL,'Nothing',11,'190'),('572G','DJ106','Tuft Medical Center','Julie','2021-01-18',NULL,NULL,'Allergies',3,'190'),('572G','MJ116','Tuft Medical Center','Julie',NULL,'2021-01-18',NULL,'Nothing',8,'190'),('603F','HJ115','Tuft Medical Center','Julie',NULL,'2020-12-24',NULL,'Nothing',7,'190'),('603F','SJ105','Tuft Medical Center','Julie','2020-12-24',NULL,NULL,'Nothing',2,'190'),('839H','IJ117','Tuft Medical Center','Julie',NULL,'2021-01-18',NULL,'Fever',9,'190'),('839H','RJ107','Tuft Medical Center','Julie','2021-01-18',NULL,NULL,'Severe Allergies',4,'190');
```

```
/*!40000 ALTER TABLE `Administrations` ENABLE KEYS */;
```

```
UNLOCK TABLES;
```

Batch

```
LOCK TABLES `Batch` WRITE;
```

```
/*!40000 ALTER TABLE `Batch` DISABLE KEYS */;
```

```
INSERT INTO `Batch` VALUES ('190','2021-06-02','Moderna'),('220','2021-04-05','Pfizer- BioNTech'),('480','2021-08-02','AstraZeneca');
```

```
/*!40000 ALTER TABLE `Batch` ENABLE KEYS */;
```

```
UNLOCK TABLES;
```

```
/*!40103 SET TIME_ZONE=@OLD_TIME_ZONE */;
```

Vaccine NCD

```
LOCK TABLES `Vaccine NCD` WRITE;
```

```
/*!40000 ALTER TABLE `Vaccine NCD` DISABLE KEYS */;
```

```
INSERT INTO `Vaccine NCD` VALUES
```

```
(1,'190'),(2,'190'),(3,'190'),(4,'190'),(5,'190'),(6,'190'),(7,'190'),(8,'190'),(9,'190'),(10,'190'),(11,'190'),(12,'190'),(1,'220'),(2,'220'),(3,'220'),(4,'220'),(5,'2  
20'),(6,'220'),(7,'220'),(1,'480');
```

```
/*!40000 ALTER TABLE `Vaccine NCD` ENABLE KEYS */;
```

```
UNLOCK TABLES;
```

```
/*!40103 SET TIME_ZONE=@OLD_TIME_ZONE */;
```

Orders

```
LOCK TABLES `Orders` WRITE;
```

```
/*!40000 ALTER TABLE `Orders` DISABLE KEYS *;  
INSERT INTO `Orders` VALUES ('1M',10,'2020-11-15','190'),('2P',15,'2020-12-01','220'),('3M',20,'2020-12-18','190'),('4A',50,'2020-12-30','480');  
/*!40000 ALTER TABLE `Orders` ENABLE KEYS *;  
UNLOCK TABLES;  
/*!40103 SET TIME_ZONE=@OLD_TIME_ZONE */;
```

Shipments

```
LOCK TABLES `Shipments` WRITE;  
/*!40000 ALTER TABLE `Shipments` DISABLE KEYS *;  
INSERT INTO `Shipments` VALUES ('19012301US-MA','2020-11-25','190','1M'),('19015602US-MA','2020-12-28','190','3M'),('19025301US-MA','2020-01-11','480','4A'),('22001903US-MA','2020-12-11','220','2P');  
/*!40000 ALTER TABLE `Shipments` ENABLE KEYS *;  
UNLOCK TABLES;  
/*!40103 SET TIME_ZONE=@OLD_TIME_ZONE */;
```

Storage

```
LOCK TABLES `Storage` WRITE;  
/*!40000 ALTER TABLE `Storage` DISABLE KEYS *;  
INSERT INTO `Storage` VALUES ('STG1',-20,1,'9','19012301US-MA','1M'),('STG1',-20,3,'17','19015602US-MA','3M'),('STG2',-70,8,'7','22001903US-MA','2P'),('STG3',4,49,'1','19025301US-MA','4A');  
/*!40000 ALTER TABLE `Storage` ENABLE KEYS *;  
UNLOCK TABLES;  
/*!40103 SET TIME_ZONE=@OLD_TIME_ZONE */;
```