HealthShare HS2020-06 Alert

8-JUN-2020

Dear HealthShare Customer:

I am writing because you are listed as the Security Contact for your organization. When risks have been uncovered that concern your use of HealthShare®, InterSystems is committed to providing you the necessary information so that you can assess your situation as quickly as possible.

We have identified several risks related to HealthShare Health Insight that may affect the operational and clinical safety use of Health Insight.

Please read the information that follows. If you have any questions, please contact InterSystems Support at support@intersystems.com or +1.617.621.0700.

We understand and take very seriously our commitment to you to provide an effective and efficient solution while protecting patient safety and safeguarding patient information. Our HealthShare Alert process complements our existing support processes. If you have questions about our processes for data protection, privacy, and security, including our Global Trust program, you can reach our Data Protection Officer Ken Mortensen at dpo@intersystems.com.

If you ever have any privacy, security, patient safety or operations related questions about HealthShare, do not hesitate to contact the Worldwide Response Center (WRC) through support@intersystems.com or +1.617.621.0700, so that we can assist you.

Respectfully,

Jonathan Teich, MD
Director, Product Management – HealthShare

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Summary of Alerts

This HealthShare Alert ensures that InterSystems gets you the information you need to understand important clinical safety, privacy, security, and operational risks that have been identified, and complements our existing support processes.

This document contains the following Alerts:

Alert or Advisory	Product & Versions Affected	Risk Category & Score
HS2020-06-01: Health Insight Transfer Process is Unable to Process Messages when a Message gets Stuck in the Transfer Operation	The affected Products and Versions are: • Health Insight 2018.1, 2019.1, 2019.1.1, 2019.1.2, 2020.1	Medium Risk (Operational) Low Risk (Clinical Safety)
HS2020-06-02: When Stopping the Transfer Operation Jobs Forcibly, the Health Insight Batch Process may cause Unprocessed and Stuck Messages	The affected Products and Versions are: • Health Insight 2019.1.2, 2020.1	Medium Risk (Operational) Low Risk (Clinical Safety)

We encourage you to read the information below and then reach out to the Worldwide Response Center (WRC) at support@intersystems.com or +1.617.621.0700 with any questions that might arise.

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HealthShare Alert

Detail of Alerts

HS2020-06-01: Health Insight Transfer Process is Unable to Process Messages when a Message gets Stuck in the Transfer Operation

Issue date: 8-JUN-2020

Risk Category and Score:

Clinical Safety	Privacy	Security	Operational
2-Low Risk	No Risk	No Risk	3-Medium Risk

Version and System Area Affected

HealthShare® Products: Health Insight

Versions: 2018.1, 2019.1, 2019.1.1, 2019.1.2, 2020.1

System areas affected: Data ingestion, including the transfer process and the transfer operation

Reference: HSHI-4092 / YCL015 and HSHI-4185 / YCL016

Summary of Issue

During normal data ingestion into Health Insight, each patient message that is queued on the Transfer Process is sent on a FIFO basis to a queue on the Transfer Operation for processing. When it sends a message for processing, the Transfer Process sets a global node containing the patient identifier and message ID to indicate "active" processing of the message. In a normal processing scenario, the active global is killed by the Transfer Operation when it finishes processing the message. Before sending any new message for processing, the Transfer Process checks the global and uses a retry mechanism for any message that cannot be processed immediately. A message with a retry flag is placed at the top of the Transfer Process message queue to allow time for the Transfer Operation to finish processing the earlier message.

In rare and abnormal scenarios, if the Transfer Operation is unable to complete processing of a patient message, the active global for that message persists even though the Transfer Operation queue is empty. When this occurs, the Transfer Process repeatedly requeues a message for the same patient at the top of the queue, causing a buildup of messages for all patients on the queue. In order to resume normal message processing, a manual intervention to kill the active global is required.

The ad hoc provided with this alert corrects this issue, which occurs when the active global is not killed and the Transfer Operation both has an empty queue and is not processing any messages. This ad hoc provides a check before sending a message for retry for any active message on the Transfer Operation queue. If the queue is empty and there is no message being processed, the Transfer Process kills the global node and logs the errored patient's identifier as a WARNING in the Ens_Util.Log. The Transfer Process will also record the identifier in the Patient Errors global. The Transfer Process then resumes normal operations and continues sending patient messages to the Transfer Operation. With this ad hoc in place, a message that encounters an error during Transfer Operation processing no longer causes the data flowing into Health Insight to stop, thereby improving the robustness of data ingestion.

Full details of the identified issue appear in the [Technical Addendum for HS2020-06-01](#).

Risk Assessment

The risk score and category were determined using InterSystems' Risk Rating process (outlined in the addendum), and based on the following assessments:

Clinical Safety: [Risk Score (Risk Category)]   Severity of typical adverse outcome = 2 out of 5
Likelihood of typical adverse outcome = 2 out of 5

Operational: [Risk Score (Risk Category)]   Severity of typical adverse outcome = 3 out of 5
Likelihood of typical adverse outcome = 3 out of 5

Recommended Actions

InterSystems strongly recommends that customer organizations take the following action:

1. Request an ad hoc that includes the fix for this issue (HSHI-4092 / YCL015) as well as another related queue status fix (HSHI-4185 / YCL016) and apply it to your Health Insight instance.
2. On an ongoing basis, monitor transfer errors on the **Internal Management** > **Patient Error Management** page in the Health Insight Management Portal. This page monitors the ^ISC.HSAA.PatientErrors or ^IRIS.HSAA.PatientErrors global. Once the root cause of an error has been cleared, resend any patient that had errors. Once the ad hoc has been applied, errored patient messages will not block ongoing processing.

If you have any questions regarding this alert, please contact the Worldwide Response Center, and reference "Alert HS2020-06".

Technical Addendum for HS2020-06-01

Description of Issue

This alert resolves an issue in which an errored patient message in the Transfer Operation (`HSAA.TransferSDA3.Operation.Transfer`) blocks the Transfer Process (HSAA.TransferSDA3.Process.Transfer) from sending patient messages to the Transfer Operation queue, causing the queue on the Transfer Process to build up. Only a manual intervention clears the blockage.

The Transfer Process is a FIFO business process that handles a production queue of *AnalyticsUpdateRequest* messages. Health Insight uses a global to track which patient messages are undergoing active processing on the Transfer Operation. The "active" global, ^IRIS.HSAA.TransferAnalyticsID (on version 2019.1.2 and earlier, the global is named ^ISC.HSAA.TransferAnalyticsID), has a node containing the patient's HSAAID and the message ID of the *AnalyticsUpdateRequest* message being processed.

Upon receiving an *AnalyticsUpdateRequest*, the Transfer Process checks the active global to see if the same patient is currently being processed by the Transfer Operation:

- If it finds that the patient is being processed by the Transfer Operation, the Transfer Process sets the *Retry* property of the incoming message and sends the message back to the top of the Transfer Process message queue to be retried after a certain interval.
- If it finds that the patient is *not* being processed by the Transfer Operation, the Transfer Process sets a node in the active global and then sends the message to the Transfer Operation queue. The Transfer Operation kills this global node after it completes processing of the patient message.

In normal operations, after one or a few retries, when processing of the current patient message is completed and the global node is killed, the message set for *Retry* is sent along to the Transfer Operation and subsequent messages for the patient will then also be processed in the FIFO manner. However, in rare and abnormal scenarios, a message errors out on the Transfer Operation and the global node for the patient never gets killed. This can lead to an *AnalyticsUpdateRequest* message set for *Retry* being repeatedly re-queued by the Transfer Process while there are no *AnalyticsUpdateRequest* messages being sent to or processed by the Transfer Operation while the Transfer Operation queue is empty. The end result is that the message queue on the Transfer Process grows with no active messages being processed on the Transfer Operation, thereby causing a stoppage of Health Insight data ingestion unless the errant global node is killed manually.

To prevent this issue from happening, the ad hoc included with this alert adds logic to the *Retry* mechanism of the Transfer Process. The new logic checks the Transfer Operation queue before sending a message for *Retry*. If there is no active message being processed and the Transfer Operation queue is empty, then the abnormal scenario is occurring. The Transfer Process kills the global node for the errored patient message, and logs the HSAAID and message ID as a WARNING in the Ens_Util.Log for tracing and troubleshooting. It also logs this information in the Patient Errors global, ^IRIS.HSAA.PatientErrors (on version 2019.1.2 and earlier the global is ^ISC.HSAA.PatientErrors), for future resends.

Determining if the Issue is Occurring on Your System

The following are indications that the issue addressed in this alert is occurring on your system:

1. The messages on the `HSAA.TransferSDA3.Process.Transfer` queue have been accumulating and the queue is large.
2. There is no active *AnalyticsUpdateRequest* message being processed on `HSAA.TransferSDA3.Operation.Transfer` and its queue is empty.
3. The ^ISC.HSAA.TransferAnalyticsID or ^IRIS.HSAA.TransferAnalyticsID global has been stuck for an unreasonably long time on a specific HSAAID node.

When all of these conditions occur, the immediate workaround is to manually kill the global node in ^ISC.HSAA.TransferAnalyticsID (or ^IRIS.HSAA.TransferAnalyticsID) for the stuck HSAAID. Customers should always consult with the WRC first before making any manual changes to globals. The WRC can also help diagnose why the message errored and help you come up with a solution.

Recommended Action

1. Request ad hoc that includes the fix for this issue (HSHI-4092), as well as another related queue status fix (HSHI-4185 / YCL016) and apply it to your HealthShare Health Insight instance.

2. On an ongoing basis, monitor transfer errors on the **Internal Management** > **Patient Error Management** page in the Health Insight Management Portal. This page monitors the ^ISC.HSAA.PatientErrors or ^IRIS.HSAA.PatientErrors global. Once the root cause of an error has been cleared, resend any patient that had errors. Once the ad hoc has been applied, errored messages will not block ongoing processing.

Information about the Correction

The corrections for this defect is identified as HSHI-4092 and HSHI-4185, which will be included in all future product releases. It is also available via the ad hoc change file (patch), from the WRC.

If you have any questions regarding this alert, please contact the Worldwide Response Center, and reference "Alert HS2020-06".

End of Alert HS2020-06-01

HS2020-06-02: When Stopping the Transfer Operation Jobs Forcibly, the Health Insight Batch Process may cause Unprocessed and Stuck Messages

Issue date: 8-JUN-2020

Risk Category and Score:

Clinical Safety	Privacy	Security	Operational
2-Low Risk	No Risk	No Risk	3-Medium Risk

Version and System Area Affected

HealthShare® Products: Health Insight

Versions: 2019.1.2, 2020.1

System areas affected: Batch Process and Transfer Operation

Reference: HSHI-4093 / YCL014

Summary of Issue

During normal operations, Health Insight pauses data ingestion periodically to allow other processing to occur. It uses a Batch Process to stop all jobs on the Transfer Operation before updating the production and cleaning up dead jobs. If stopping all jobs in serial takes a long time, there is an option (starting in Health Insight 2019.1.2) to forcibly stop all Transfer Operation jobs in parallel instead. This is useful especially when there are large messages that take a long time to finish processing.

The process of stopping all jobs forcibly in parallel was implemented by jobbing off the job-stopping tasks, and then waiting for 10 seconds before moving on to the subsequent steps. This parallel implementation could create a race condition between stopping the jobs and starting the subsequent steps: if the subsequent steps occurred before all jobs were stopped, an AnalyticsUpdateRequest message would end up unprocessed. This unprocessed message could cause data ingestion flow in the production to stop entirely.

The ad hoc provided with this alert resolves this issue by modifying the way the Transfer Operation jobs are stopped. The process of stopping the Transfer Operation jobs in parallel (when forcibly stopping the jobs at the beginning of the Batch Process) is modified in a way such that the race condition described above is avoided. Full details of the identified issue appear in the Technical Addendum for HS2020-06-02.

Risk Assessment

The risk score and category were determined using InterSystems' Risk Rating process (outlined in the addendum), and based on the following assessments:

Clinical Safety:	[Risk Score (Risk Category)]	Severity of typical adverse outcome = 2 out of 5 Likelihood of typical adverse outcome = 2 out of 5
Operational:	[Risk Score (Risk Category)]	Severity of typical adverse outcome = 3 out of 5 Likelihood of typical adverse outcome = 3 out of 5

Recommended Actions

InterSystems strongly recommends that customer organizations who are using Health Insight 2019.1.2 and 2020.1 take the following actions:

- Obtain an ad hoc that corrects this issue, HSHI-4093 / YCL014, and HSHI-4092 / YCL015 and HSHI-4185 / YCL016. Correcting HSHI-4093 removes a potential cause of the issue described in HSHI-4092 and HSHI-4185, while correcting HSHI-4092 and HSHI-4185 provides a solution to allow data ingestion to resume normally. Note that customers with versions earlier than 2019.1.2 do not need a correction for this issue.

If you have any questions regarding this alert, please contact the Worldwide Response Center, and reference "Alert HS2020-06".

Technical Addendum for HS2020-06-02

Description of Issue

During normal operations, Health Insight pauses data ingestion periodically to allow other processing to occur. It uses a Batch Process (`HSAA.TransferSDA3.Process.Batch`) to stop all jobs on the Transfer Operation (`HSAA.TransferSDA3.Operation.Transfer`), and then updates the production and cleans up dead jobs.

InterSystems has corrected a defect that can cause an issue in the Batch Process where some messages could get stuck in an unprocessed state when customers selected the parallel stop option. The unprocessed messages could lead to a stoppage of data flowing into Health Insight.

Starting in Health Insight 2019.1.2, an option was introduced to allow customers to choose to forcibly stop all Transfer Operation jobs in parallel, as opposed to stopping all jobs in serial. The latter option was found to be too slow, as the Batch Process could not get started in time when there were large messages. The process of stopping all jobs forcibly in parallel was implemented by jobbing off the job-stopping tasks, and then waiting for 10 seconds before moving on to subsequent tasks (updating the production and cleaning up dead jobs). This implementation could potentially create a race condition between stopping the jobs and updating the production. When that race condition occurs, updating the production could occur before all jobs had been stopped, resulting in an *AnalyticsUpdateRequest* message either being stuck in a Delivered (but not processed) state or in the message getting flagged in CrashedMessages (which are also not processed and not passed to the **MessageHandler()** method of the Transfer Operation for processing). The end result was that the "active" global, ^IRIS.HSAA.TransferAnalyticsID (^ISC.HSAA.TransferAnalyticsID in version 2019.1.2), had a node set to indicate that a patient message was being processed by the Transfer Operation. However, that node would never be killed, thereby causing the Transfer Process (`HSAA.TransferSDA3.Process.Transfer`) to continually retry the message for the patient, causing the flow of data ingestion in the production to stop.

The ad hoc provided with this alert resolves this issue by modifying the implementation for stopping the Transfer Operation jobs in parallel at the beginning of the Batch Process. The modified implementation uses the `%SYSTEM.WorkMgr` to initialize a queue with the number of workers set as the pool size of the Transfer Operation, and jobs off the `##class(Ens.Job).Stop()` commands. It then waits for all job-stopping tasks to complete so that the Batch Process can know for sure that all jobs have stopped before calling **UpdateProduction()**.

Determining if the Issue is Occurring on Your System

You can run the following example query in your Health Insight analytics namespace to see whether there is any patient or AnalyticsID stuck as a previously crashed message:

```
SELECT AnalyticsID
FROM HS_Message.AnalyticsUpdateRequest
WHERE ID IN
   (SELECT DISTINCT MessageBodyId
   FROM Ens.MessageHeader
   WHERE SessionId IN
      (SELECT DISTINCT SessionId
      FROM Ens_Util.Log
      WHERE ConfigName = 'HSAA.TransferSDA3.Operation.Transfer'
      AND Type = 'Error'
      AND Text LIKE '%<Ens>ErrPreviouslyCrashedMessage%'))
```

If you find patients in this state, contact the WRC.

Recommended Action

Because this alert identifies a potential root cause for the issue described in HS2020-06-01 (HSHI-4092 and HSHI-4185), InterSystems strongly recommends customers who are on HealthShare Health Insight 2019.1.2 and higher obtain an ad hoc that contains fixes for both issues HSHI-4092 (and HSHI-4185) and HSHI-4093. For customers who are on a Health Insight version lower than 2019.1.2 (for example, 2018.1 or 2019.1, or 2019.1.1), obtaining an ad hoc for this alert does not apply, but obtaining an ad hoc for HSHI-4092 and HSHI-4185 is still recommended.

Please contact InterSystems' Worldwide Response Center (WRC) with any questions or for additional information.

Information about the Correction

The correction for this defect is identified as HSHI-4093, which will be included in all future product releases. It is also available via ad hoc change file (patch) from the Worldwide Response Center (WRC).

If you have any questions regarding this alert, please contact the Worldwide Response Center, and reference "Alert HS2020-06".

End of Alert HS2020-06-02

– End of HS2020-06 Alerts –

Addendum

Clinical Risk Rating Process

InterSystems' clinical risk rating uses standard methodology to estimate the risk of a system hazard based on the most typical foreseeable adverse patient outcome, as opposed to the worst-case scenario. Experienced clinicians in our clinical safety team provide an estimate of the severity and likelihood using standard ordinal scales to derive the risk category.

Description of Outcome Severity

5	Catastrophic	Multiple patients	Death. Permanent life-changing incapacity. Severe injury or incapacity from which recovery is not expected in the short term.
4	Major	Single patient	Death. Permanent life-changing incapacity. Severe injury or incapacity from which recovery is not expected in the short term.
		Multiple patients	Severe injury or incapacity from which recovery is expected in the short term. Severe psychological trauma.
3	Moderate	Single patient	Severe injury or incapacity from which recovery is expected in the short term. Severe psychological trauma.
		Multiple patients	Minor injury from which recovery is not expected in the short term. Significant psychological trauma.
2	Minor	Single patient	Minor injury from which recovery is not expected in the short term. Significant psychological trauma.
		Multiple patients	Minor injury from which recovery is expected in the short term. Minor psychological upset. Inconvenience.
1	Minimal	Single patient	Minimal injury from which recovery is expected in the short term. Minor psychological upset. Inconvenience.

Description of Outcome Likelihood

5	Very High	Will undoubtedly happen/recur, possibly frequently	Expected to occur at least daily
4	High	Will probably happen/recur, but it is not a persisting issue/ circumstances	Expected to occur at least weekly
3	Medium	Might happen or recur occasionally	Expected to occur at least monthly
2	Low	Do not expect it to happen/recur but it is possible it may do so	Expected to occur at least annually
1	Very low	This will probably never happen/recur	Not expected to occur for years

Risk Score & Category

The combination of the Severity and Likelihood produce an overall Risk Score and Risk Category as follows:

Impact \ Likelihood	1	2	3	4	5
5	3	4	4	5	5
4	2	3	3	4	5
3	2	2	3	3	4
2	1	2	2	3	4
1	1	1	2	2	3

Risk Score	Risk Category
5	Very high risk
4	High risk
3	Medium risk
2	Low risk
1	Very low risk

Privacy Risk Rating Process

InterSystems' risk rating uses standard methodology to estimate the risk to privacy based on the most typical foreseeable adverse outcomes, as opposed to the worst-case scenario, which is used to determine the impact and likelihood using standard ordinal scales to derive the risk rating.

Description of Impact Rating

5	Critical	Full public disclosure of confidential information, complete impact to data integrity, severe violation of legitimate basis for processing.
4	High	Disclosure to improper and unauthorized parties, operational impact to data integrity, elevated violation of legitimate basis for processing
3	Moderate	Limited disclosure to improper or unauthorized parties, limited impact to data integrity, existing violation of legitimate basis for processing
2	Low	Restricted disclosure to improper parties, restricted impact to data integrity, marginal violation of legitimate basis for processing
1	Minimal	No disclosure to improper or unauthorized parties, no discernable impact to data integrity, trivial or technical violation of legitimate basis for processing

Description of Outcome Likelihood

5	Critical	Will undoubtedly happen/recur, possibly frequently	Expected to occur at every operational or use or with all processing
4	High	Will probably happen/recur, but it is not a persisting issue/ circumstances	Expected to occur regularly or with most processing
3	Moderate	Might happen or recur occasionally	Expected to occur occasionally or with some processing
2	Low	Do not expect it to happen/recur but it is possible it may do so	Expected to occur a few times or with limited processing
1	Minimal	Unlikely happen/recur	Not expected to occur over time of normal operation

Risk Score & Category

The combination of the Impact and Likelihood produce an overall Risk Score and Risk Category as follows:

Impact	1	2	3	4	5
5	3	4	4	5	5
4	2	3	3	4	5
3	2	2	3	3	4
2	1	2	2	3	4
1	1	1	2	2	3

Likelihood →

Risk Score	Risk Category
5	Very high risk
4	High risk
3	Medium risk
2	Low risk
1	Very low risk

Security Risk Rating Process

InterSystems' risk rating uses standard methodology to estimate the risk to security based on the most typical foreseeable adverse outcomes, as opposed to the worst-case scenario, which is used to determine the impact and likelihood using standard ordinal scales to derive the risk rating.

Description of Impact Rating

5	Critical	Full failure of safeguard(s) (administrative, physical, or technical) relating to confidentiality, integrity, and/or availability
4	High	Major (majority) failure of safeguard(s) (administrative, physical, or technical) relating to confidentiality, integrity, and/or availability
3	Moderate	Limited failure of safeguard(s) (administrative, physical, or technical) relating to confidentiality, integrity, and/or availability
2	Low	Marginal failure of safeguard(s) (administrative, physical, or technical) relating to confidentiality, integrity, and/or availability
1	Minimal	Incomplete (or intermittent) failure of safeguard(s) (administrative, physical, or technical) relating to confidentiality, integrity, and/or availability

Description of Outcome Likelihood

5	Critical	Will undoubtedly happen/recur, possibly frequently	Expected to occur at every operational or use or with all processing
4	High	Will probably happen/recur, but it is not a persisting issue/ circumstances	Expected to occur regularly or with most processing
3	Moderate	Might happen or recur occasionally	Expected to occur occasionally or with some processing
2	Low	Do not expect it to happen/recur but it is possible it may do so	Expected to occur a few times or with limited processing
1	Minimal	Unlikely happen/recur	Not expected to occur over time of normal operation

Risk Score & Category

The combination of the Impact and Likelihood produce an overall Risk Score and Risk Rating as follows:

Impact

	5	3	4	4	5	5
	4	2	3	3	4	5
	3	2	2	3	3	4
	2	1	2	2	3	4
	1	1	1	2	2	3
		1	2	3	4	5

Likelihood

Risk Score	Risk Category
5	Very high risk
4	High risk
3	Moderate risk
2	Low risk
1	Minimal risk

Operational Risk Rating Process

InterSystems' risk rating uses standard methodology to estimate the risk to operations based on the most typical foreseeable adverse outcomes, as opposed to the worst-case scenario, which is used to determine the impact and likelihood using standard ordinal scales to derive the risk rating. Operational Risk is the failure of the operational system (application, O/S, database, etc.) relating to:

- **System Performance**: the system performs with the expected functionality, throughput, and utilization.
- **Data Quality**: the system can provide assurance of the accuracy and consistency of data over the entire life-cycle of the data, including recording the data exactly as intended and, upon later retrieval, ensuring the data are the same as when data were originally recorded.
- **System Availability**: the system responds to operations in a time better than the calculated or estimated Mean Time Between Failures (MTBF) and continues to operate without noticeable (based upon expected performance) interruption or delay.

Description of Impact Rating

5	Very high risk	Full failure of safeguard(s) (administrative, physical, or technical) relating to performance, quality, or availability
4	High risk	Major (majority) failure of safeguard(s) (administrative, physical, or technical) relating to performance, quality, or availability
3	Medium risk	Limited failure of safeguard(s) (administrative, physical, or technical) relating to performance, quality, or availability
2	Low risk	Marginal failure of safeguard(s) (administrative, physical, or technical) relating to performance, quality, or availability
1	Very low risk	Incomplete (or intermittent) failure of safeguard(s) (administrative, physical, or technical) relating to performance, quality, or availability

Description of Outcome Likelihood

5	Very high risk	Will undoubtedly happen/recur, possibly frequently	Expected to occur at every operational or use or with all processing
4	High risk	Will probably happen/recur, but it is not a persisting issue/ circumstances	Expected to occur regularly or with most processing
3	Medium risk	Might happen or recur occasionally	Expected to occur occasionally or with some processing
2	Low risk	Do not expect it to happen/recur but it is possible it may do so	Expected to occur a few times or with limited processing
1	Very low risk	Unlikely happen/recur	Not expected to occur over time of normal operation

Risk Score & Category

The combination of the Impact and Likelihood produce an overall Risk Score and Risk Rating as follows:

Impact \ Likelihood	1	2	3	4	5
5	3	4	4	5	5
4	2	3	3	4	5
3	2	2	3	3	4
2	1	2	2	3	4
1	1	1	2	2	3

Risk Score	Risk Category
5	Very high risk
4	High risk
3	Medium risk
2	Low risk
1	Very low risk

– End of HS2020-06 Alert Communication –